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Table of Contents

Vol. 41, No. 23 — October 15, 1942

News Developments

Trends: Refinery Operations Better Demand Gage Than Oil Production 9
Higher Prices, More Steel, Needed to Spur Discovery ..... *Henry D. Ralph* 10
This Week 11
Revenue From Refinery Products Now Lowest Realized in 16 Months ..... *J. P. O'Donnell* 13
Bonus for Increased Fuel-Oil Yields Urged at Texas Meeting ..... *Robert Ingram* 14
Joint Use of All Industry Facilities Is in Prospect 15
News From the State Capitals 16
Editorial: Query Answered 17
Future Rubber Policy Second Only to Winning Present War ..... *Arch L. Foster* 18
Restrictions Are Modified on Equipment in California 20
Independent Producers' Role in Wartime to Be Analyzed 23
Adjustment of Natural Gas Balances Big Task Facing Postwar Period ..... *J. French Robinson* 25
Hunter and Brown Led Battle Against Inimical Tax Change 26
Renewal of Depletion Fight Is Promised by LaFollette 26
Machinery Being Created to Operate Product-Pool Plan 29
Deaths 29
Natural Gas News 30
Typical Oil-Field Structures: Truncated Shore Line 48B
Refinery Activity and Expansion 59
Pipe-Line Activity 61
Gas Storage Project Started in Playa Del Rey Field ..... *L. P. Stockman* 64
Summary of Field Operations, August 1942 85

Engineering—Operating

Casing Corrosion in Old Fields Producing Sour Gas ..... *T. D. Bailey and Alex M. Crowell* 31
Chemicals From Petroleum ..... *W. T. Ziegenhain* 34
Saving Critical Materials by Reusing Still Tubes 34
Operating Ideas 36
The Nitration of Aliphatic Hydrocarbons (Part 1) ..... *Gustav Egloff, M. Alexander, and P. M. Van Arsdell* 39
Refinery Ideas 46
OPC Issues Recommendations on Use of Refinery Instruments 48
Questions on Technology ..... *W. L. Nelson* 50
Co$t Engineering: Saving of Steel Costs Through Drilling-Mud Control 51
Engineering Fundamentals: Application of Data From Steam Engine Indicators 53
Journalog: Discovery Well of Guthrie Townsite Pool, Logan County, Oklahoma 55

Field Developments

Field Developments 63
Illinois 66
Michigan ..... *Otto C. Pressprich* 68
Southwest Texas ..... *F. L. Singleton* 70
California ..... *L. P. Stockman* 72
Rocky Mountain Area ..... *T. R. Ingram* 74
Oklahoma ..... *Carl Hoot* 76
Permian Basin, Panhandle ..... *Robert Ingram* 78
Eastern Texas ..... *Robert Ingram* 79
Louisiana Gulf Coast ..... *F. L. Singleton* 79
Texas Gulf Coast ..... *F. L. Singleton* 80
Indiana, Ohio, Kentucky 81
North Central Texas ..... *Robert Ingram* 82
Canada ..... *Victor Lauriston* 83
Kansas, Nebraska ..... *Carl Hoot* 84
North Louisiana-Arkansas 84
Appalachian Fields 85
Among Drilling Contractors 86

Markets and Prices

Group 3 Market 90
New York Market 90
A.P.I. Refinery Report 90
Gulf Coast Market 90
Refinery and Tank-Wagon Prices 91
Crude-Oil Prices 91

Additional Features

Personal Paragraphs 88
Equipment News 93
Classified Advertising 94
Advertisers' Index 96

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General Heading: **BAKER GUIDING, FLOATING, CEMENTING EQUIPMENT**

Unit No. **A-15**

Subject: **How To Do That Shoe Job Successfully The *First Time***

BAKER OIL TOOLS, INC.

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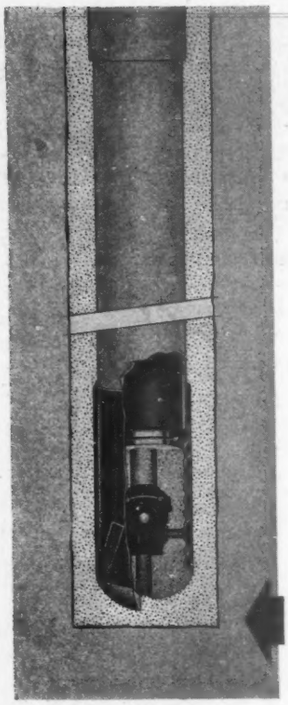


DO THAT SHOE JOB THE FIRST TIME WITH A . . .

Under today's conditions, the securing of a successful first-time cement job is more than just "important" . . . *it is vital!* We can't afford to lose the additional man hours, rig time and materials required for a "second-time" job. They are needed to drill and cement a second well—not for second-time use on the same well.

Baker's contribution to this war-time problem, is making available cementing devices which afford every possible opportunity for securing successful results the *first time.*

An outstanding example of such a device is the *Baker Cement Wash-Down Whirler Float Shoe (usually used in combination with a Baker Cement Float Collar). This Shoe not only assures safe and proper landing of the casing, but through its efficient "whirler action" provides best possible chance for complete encasement of the pipe with a uniform body of cement, with the hazard of channeling reduced to a minimum. In addition, when the cement job is completed, the internal construction of the Baker Cement Wash-Down Whirler Float Shoe can quickly and easily be drilled out leaving no harmful fragments in the hole to interfere with further deepening operations.

For complete details concerning the Baker Cement Wash-Down Whirler Float Shoe and other efficient Baker Guiding, Floating and Cementing units, see pages 227-241 of the 1942 Baker or Composite Catalog.

★ BAKER CEMENT WASH-DOWN WHIRLER FLOAT SHOE

PRODUCT NO. 120

Baker Cement Wash-Down Whirler *Float Shoe. (*The Baker Wash-Down Whirler principle is also available in a Guide Shoe)

IMPORTANT FEATURES:

(1) **THREADED CONNECTION FURNISHED TO FIT ANY TYPE CASING.** Baker Floating Units can be furnished with threaded connection to fit the specifications of your casing. (Float Collars can be furnished with both "double female" and "male and female" threaded connections.) Manufacturing precision assures thread uniformity and accuracy.

(2) **STRENGTH.** The seamless steel casing shoe into which the concrete plug and plastic BALL-TYPE Valve Assembly are securely anchored, provides a unit that has the STRENGTH to float the longest and heaviest string of casing with an ample factor of SAFETY.

(3) **POSITIVE, LEAK-PROOF BACK-PRESSURE VALVE.** The buoyant Plastic BALL-TYPE Back-Pressure Valve floats in the cement slurry or rotary mud and instantly forms a leak-proof double seal against a narrow, tough rubber ring (backed by Plastic and concrete) at the slightest reversal of pressure. Here Is Valve Efficiency at its best.

(4) **AMPLE CIRCULATION AREAS.** The correctly designed, streamlined Valve Assembly provides passageways ample for any circulating or cementing operation . . . a fact attested to by actual field performance under the most severe operating conditions.

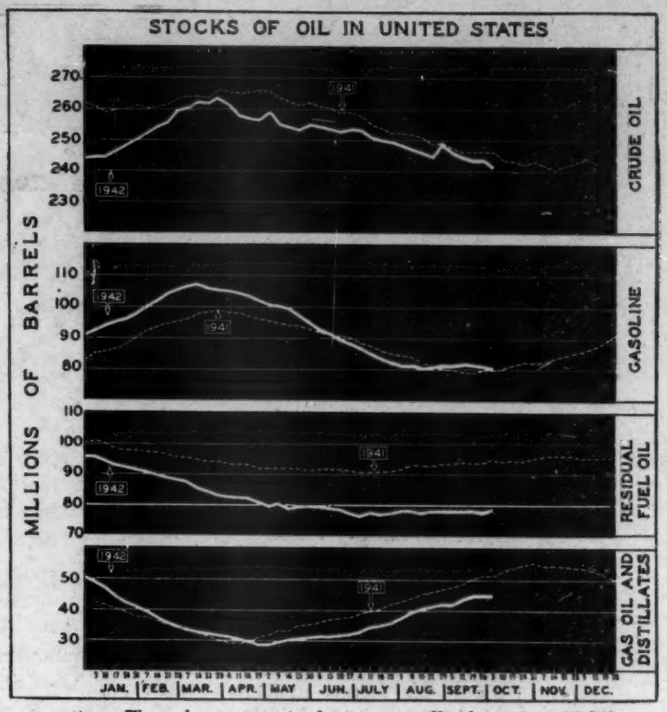
(5) **BAFFLED WHIRLER PORTS** provide wash-down whirler action so important in washing away bridges, preparing formation to receive the slurry, and securing uniform cement distribution. Here is the ultimate in Cementing Efficiency.

(6) **EASY DRILLABILITY** results from the internal construction of Baker Formula Concrete and Plastic . . . the Plastic BALL-TYPE Valve Assembly being set on end in the concrete plug to present a minimum cross-sectional area to the drilling bit. The concrete and the Plastic are quickly drilled up and circulated out of the hole.

Baker Cement Float Shoe
Baker Cement Float Collar
Product No. 100
Product No. 101 M&F
Baker Cement Guide Casing Shoe
Product No. 102
Baker Cement Wash-Down Whirler Float Shoe
Product No. 120
Baker Cement Wash-Down Whirler Guide Shoe
Product No. 121

Trends

Refinery Operations Better Demand Gage Than Oil Production



IT is apparent from a study of recent data and the charts on this page that refinery crude runs to stills have become a better gage of consumption trends than are the reports covering crude-oil production. Refinery operations have shown a steady climb over the past 4½ months and the 3,879,000-bbl. daily average for the week ending October 3, was 486,000 bbl. daily or 14.3 per cent greater than the low point of the year which was the week ending May 23. Oklahoma-Kansas is the only refining area in which crude runs to stills have not increased over this period with the following gains in the noncensored areas: Indiana, Illinois, and Kentucky, 5 per cent; Rocky Mountain states, 12 per cent, and California 14 per cent.

CRUDE PRODUCTION *3,869,545 bbl. daily average—up 183,100 bbl. One year ago 4,084,500 bbl.*

CRUDE STOCKS *241,179,000 bbl. as of Oct. 3—down 1,606,000 bbl. One year ago 246,144,000 bbl.*

GASOLINE STOCKS *80,361,000 bbl. as of Oct. 3 — down 189,000 bbl. One year ago 79,923,000 bbl.*

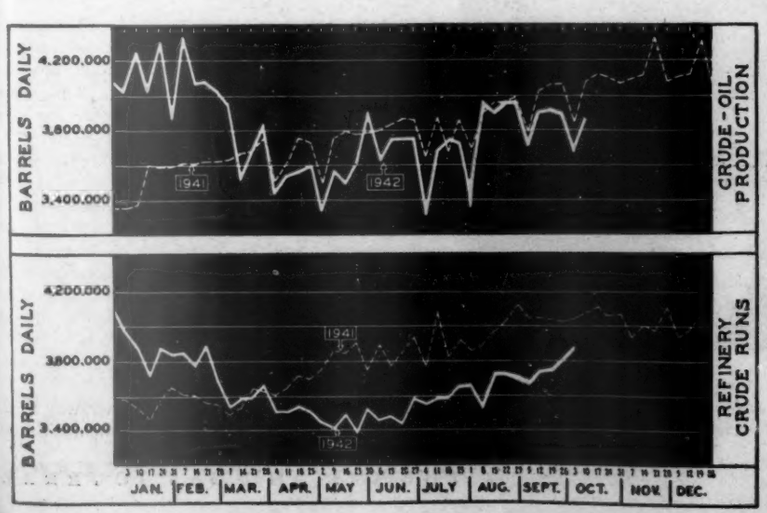
RESIDUAL FUEL-OIL STOCKS *79,036,000 bbl. as of Oct. 3 — up 93,000 bbl. One year ago 94,978,000 bbl.*

GAS OIL AND DISTILLATES *45,750,000 bbl. as of Oct. 3 — down 195,000 bbl. One year ago 51,420,000 bbl.*

REFINERY RUNS *3,879,000 bbl. daily week ended Oct. 3—up 77,000 bbl. One year ago 4,052,000 bbl.*

Refinery report for week ended October 10 delayed because of holiday.

The censored area consisting of Texas, Louisiana, Arkansas, and the Atlantic seaboard with an increase of 358,000 bbl. daily or 24.5 per cent accounts for most of the total gain since late May. This increase reflects the adjustments that have been made in domestic transportation operations plus greater lend-lease business with the result that many refineries in the censored area have been able to resume normal operating levels. The reports on stocks of refinery operations show that these enlarged operations have not been excessive. They have not in fact generally kept pace with demands including seasonal storage requirements, and still further expansion in plant operations over the remainder of the year is in prospect. It is predicted that many refiners shortly will be asked to further reduce the gasoline yields at their plants. This is not due to excess supplies on hand or in prospect but is necessary in order to take care of the expanding demands for all grades of fuel oil extending from the residuals to the highest gravity furnace oils and diesel oils. The problem of future supplies of these oils for the East and Middle West has not been solved according to those closest to conditions.



DAILY AVERAGE PRODUCTION FOR WEEK

	Oct. 10 crude oil	Oct. OPC quota all oils	Oct. 3 crude oil
Arkansas	73,400	79,500	73,800
California	731,250	782,000	690,750
Colorado	6,835	7,000	6,825
Eastern fields	98,850	107,400	95,460
Illinois	271,870	280,000	264,170
Indiana	17,350	19,000	16,700
Kansas	276,300	294,000	282,700
Louisiana	325,700	337,200	325,700
North Louisiana	*97,700*	.....	*98,700*
Louisiana Gulf Coast	*228,000*	.....	*227,000*
Michigan	61,800	65,700	62,400
Mississippi	70,900	50,000	71,100
Montana	21,700	24,400	23,160
Nebraska	3,450	3,500	3,500
New Mexico	98,590	101,100	98,590
Oklahoma	365,850	417,000	365,550
Texas	1,349,300	1,407,600	1,207,200
East Texas	*362,000*	.....	*293,000*
West Texas	*206,000*	.....	*183,000*
North Central Texas	*140,000*	.....	*139,000*
East Central Texas	*90,400*	.....	*81,700*
Texas Panhandle	*85,200*	.....	*85,000*
Texas Gulf Coast	*399,000*	.....	*367,000*
Southwest Texas	*66,700*	.....	*58,500*
Wyoming	96,400	96,800	98,840
Total United States	3,869,545	4,066,200	3,688,445

Total production, January 1-October 10, 1942 ..... 1,073,380,835 bbl.
Same period last year ..... 1,061,870,150 bbl.

Texas shutdown days, Oct. 4, 10; preceding week, Sept. 27, 30, and Oct. 3.

Estimates of crude-oil demands by government agencies and the actual production have not paralleled the upward curve in refinery operations and as a result stocks of refinable crude oils have steadily decreased for several months. These developments explain why the industry's economists and operators in attendance at Washington hearings and at conventions are constantly stressing the necessity of increasing crude-oil production and, even more important, expanding exploratory operations so that new discoveries will assure adequate supplies next year and later. In this connection there is an increasing number of reports from refiners and pipe-line operators stating that they are unable to secure all the crude oil needed to meet November requirements.

Higher Prices, More Steel Needed to Spur Discovery

By HENRY D. RALPH

WASHINGTON, D. C.—Unanimity was the keynote of the hearings concluded here this week by the Senate public lands subcommittee probing the problems faced by the oil industry in supplying adequate petroleum products for the war machine and at the same time keeping reserves far enough ahead of actual demand so there will not be an actual shortage.

Some witnesses envisaged a "real threat" of shortage unless new reserves are discovered and nearly all urged some sort of stimulus for exploration and discovery of new fields.

Sen. Joseph O'Mahoney, Wyoming, chairman of the committee, said he was sure the record made at these hearings brought the problems of oil discovery and production into much clearer light than they have been heretofore.

Almost unanimous in their support of a boost in the price of crude as the most powerful incentive for promoting new discovery, industry, and government witnesses brought out the rising costs in finding new oil, as well as greater expense for stripper and secondary operations, necessary to attain maximum ultimate recovery.

Henderson Dissents

But the unanimity which marked the meeting generally did not extend to Leon Henderson, price administrator. The OPA chief did not agree that a general price increase was necessary, and said he'd have to be shown that it would bring in the reserves which were said to be needed. He said that he believed the present supply of oil in this country is adequate, except at certain points, for any war period.

This prompted Chairman O'Mahoney to observe that Mr. Henderson's statements sounded "unexpectedly like the statements we were hearing about steel and aluminum a year or so ago." From May 30 to the first part of this month, Senator O'Mahoney said, from 12,000 to 15,000 planes have raided the European installations of the Nazis. There were over 1,000,000 gal. of high-octane gasoline used in the mass raid of Cologne, he said, to make his point that petroleum supplies are seriously needed in carrying on the war.

Mr. Henderson said he thought the reserves which witnesses said exist—around 20,000,000,000 bbl.—were adequate, but that he believed refinery capacity constituted the real danger. Senator Hatch of New Mexico pointed out that this estimated reserve is, of course, "not recoverable tomorrow."

As to the crude-price increase, Mr. Henderson pointed to the reports of earnings of oil-producing companies to prove his contention that it was unnecessary. If such a representation is made for a certain field or group, his office would probably respond with a price increase as it did several months ago when it permitted a Pennsylvania crude-price increase, he said; but "I cannot for the life of me see the addition of a half billion to a billion dollars to the cost of oil for the encouragement of wildcatting."

Questioned as to how he would go about stimulating exploration for new reserves, he said there were "more direct ways," among them suspension or slashing of royalty rates on public lands, or a method of "differential pricing," such as OPA has worked out for other commodities, details of which he did not supply.

Mr. Henderson indicated that he believes wildcatting would be stimulated to a greater extent if a direct bonus were granted for drilling in unproven areas than through a general price increase.

At the close of Mr. Henderson's testimony, Russell B. Brown, general counsel for Independent Petroleum Association of America, observed that the history of the oil industry shows that new discoveries always varied in direct relation with the fluctuations of price, and that, with the price frozen for approximately a year, "we're still getting less and less oil."

A number of witnesses remarked on the necessity for unification of oil agencies in the Government, and it was pointed out that an order unifying all government oil activities under one head is being prepared. The order, it is understood, will name Secretary Ickes to the post on a footing similar to that of W. M. Jeffers, rubber director.

Mr. Ickes strengthened the plea of producers when he said in concluding his prepared statement, before the subcommittee that " . . . the importance of finding new reserves to augment the productive capacity of our known fields cannot be overemphasized. Anything that you gentlemen can do to stimulate this urgently needed activity will be a direct contribution to the winning of the war."

Wayne Johnson, New York, special petroleum consultant to the War Production Board, proposed a special incentive method of stimulating exploratory operations

The road "we have had to travel in the past year or more has been extremely tough," Mr. Ickes said. "War has dealt severely with the petroleum industry; it has led the industry from one critical situation to another."

The serious problem of transportation arose even before the war, and it has been met by the amazing figures of 800,000 bbl. a day moving into East Coast areas by tank car, he said.

Another problem which is causing some concern, Mr. Ickes said, is that of the refining branch. . . . "I refer to the changes we have had to order in refinery yields, so as to produce, from crude, more heating and industrial oils and less gasoline."

Changes Require Compensation

The coordinator pointed out he knew that these changes cost money, and that he wasn't sure "how long they can continue to do so, or how much further they can change their yields without some arrangement for compensation for the financial loss which this involves."

"I am disturbed," the secretary said, "by the results of oil finding during the last 3 years. While the number of fields found has been considerably increased, their average size has greatly diminished. The result is that, while the figures show some increase in our net reserves, the increase has not been as rapid as in previous years. Perhaps the national domain has been pretty thoroughly hunted over by the methods we have been using, and we must perfect some new way of finding oil, which will locate fields that now escape our net.

"I sincerely believe," the coordinator declared, "that the price structure might well be reviewed, and that representations of the industry—some of which have already been made to the price administrator—should be carefully weighed. It may well be that price advances should be made at this time in the light of present-day costs, and to stimulate much-needed new development. The Office of Petroleum Coordinator is prepared to collaborate with the price administrator in an analysis of this program."

Charles F. Roeser, Fort Worth, Tex., chairman of the District 3 industry functional committee, told the O'Mahoney group he thought any increase in price should be an "over all" increase, rather than a bonus for wildcatting or for new reserves only.

He also asserted that within 24 months there will be a "real" shortage if the price ceiling is not lifted. Further, he said that elimination of the 27.5 per cent depletion allowance would drive all independent operators out of the oil business.

Declining discovery trends, Mr. Roeser told the committee, "constitute a threat to the country." Initial discoveries, he said, "should be taking place right now" if actual production is to be developed to assure ample supplies "to win this war."

"The oil industry knows of no better way to do this," he said, "—a way that has demonstrated

its effectiveness in the past—than to raise the price of crude oil to provide funds now to carry on more exploration work and to furnish the reward incentive for continued future efforts. Such an increase in price cannot be considered inflationary because of the increases recently evident in the cost of producing oil, as well as the increased costs in the search for oil."

During the hearings, Chairman O'Mahoney brought to the attention of the committee and the government representatives the suggestion of Wayne Johnson, WPB oil consultant, that special depletion allowances be granted wildcatters who bring in new reserves or production. Mr. Johnson, who drafted legislation during World War 1 on the subject, said that legislation could very well be adapted to present needs.

Special Incentive Proposal

Mr. Johnson's opinions are expressed in the following extract of a message to Senator O'Mahoney:

"My suggestion is that in the case of mines, oil and gas wells brought into production by the taxpayer on or after November 1, 1942, and not included in a square surface area of 40 acres having as its center the mouth of a well producing oil and gas in commercial quantities, the depletion allowance shall be based upon the fair market value of the property at the date brought to production or within 30 days thereafter; such allowance in all the above cases to be made in accordance with the annual production limited to the estimated life of the property under rules and regulations to be prescribed by the commissioner of internal revenue with the approval of the secretary which allowance shall not be less than the 27½ per cent otherwise provided in the present revenue act.

"In the absence of a stronger showing than has already been made I am opposed to general price increases but I do think the areas now where production and consumption are practically in balance and the possibility of a shortage is more imminent such as the Rocky Mountain states and West Coast states that new production obtained after November 1, 1942, should receive a higher price due to greater costs and as a further stimulant to production. There is no accounting problem really involved in such a price increase because the runs to the pipe lines are always measured and the wells where oil is used on the property have settling tanks which are gaged each day.

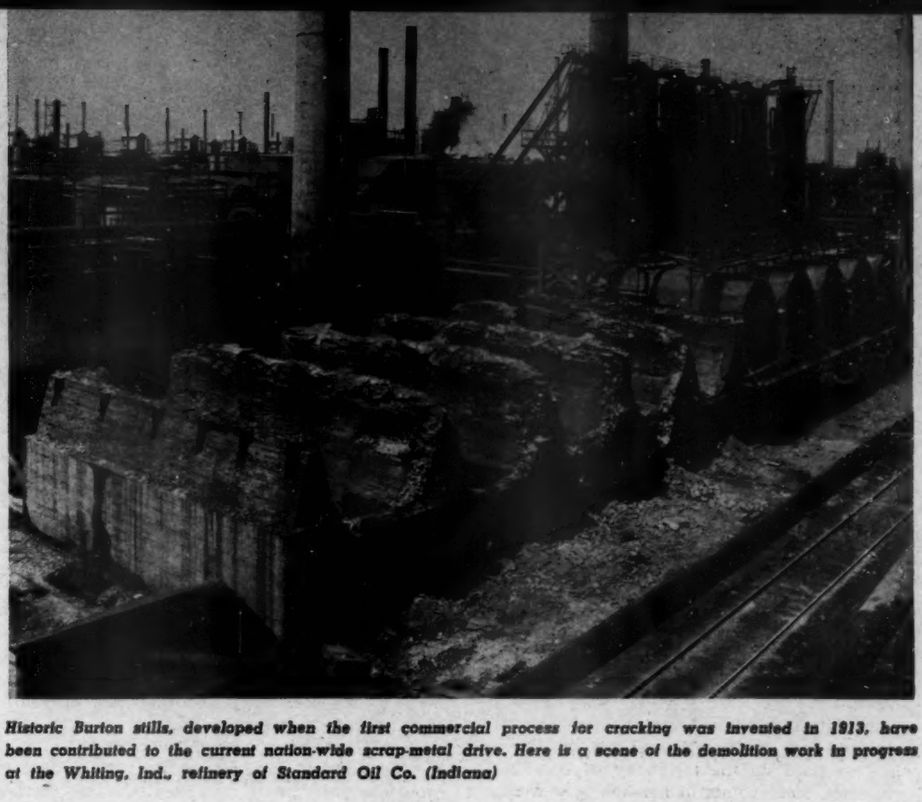
"Niether of these proposals would affect the Treasury's revenue, because they have to do with new production so they would not impair the present estimated revenue returns, would stimulate the production of highly critical and much needed raw materials and produce additional revenue as well."

Joseph B. Eastman, administrator of the Office of Defense Transportation, appeared before the committee to discuss the entire transportation picture, with particular reference to oil transportation—by rail, barge, tanker, pipe line, truck, and other methods.

In questioning at the end of Mr. Eastman's testimony, Robert E. Allen, deputy assistant oil coordinator, asserted that WPB orders and the steel shortage generally have had a "very depressing" effect on the oil industry.

A. K. Swann, Evansville, Ind., counsel for independent operators in Indiana, Illinois, and Kentucky, outlined points which he said must be considered in any program for increasing production and the search for new reserves.

As for the sharp decline in Illinois production recently, the witness said it was directly attributable to the provisions of M-68, and added that since promulgation of M-68-5, giving Illinois basin



Historic Burton stills, developed when the first commercial process for cracking was invented in 1913, have been contributed to the current nation-wide scrap-metal drive. Here is a scene of the demolition work in progress at the Whiting, Ind., refinery of Standard Oil Co. (Indiana)

This Week...

PRODUCTION.—Kansas increased allowable 7,000 bbl. per day to accommodate local refineries, state quota lifted to 301,000 bbl. daily, highest in history, about in balance with pipeline capacity. . . . OPC threatens Directive 19 action against California producer, orders well closed in despite plea that split pipe interferes. Allegedly running 1,500 bbl. daily against quota of 150. . . . Eighty-four California fields granted relief from M-68 in reworking, recompleting, reconditioning operations, a move to raise production of heavy crude. . . . Texas operators to give formal views on lease-quota proration, at Austin next week. Necessities of conserving manpower, materials likely to overweigh all other considerations. . . .

REFINING.—East Coast products-pooling area divided into six zones, organization for directing cooperative use of manufacturing and terminal facilities being set up; under direction of L. T. Kittinger, former vice president of Shell. . . . All manufacturers instructed to file lists of actual sale prices with OPA, indicating ceiling adjustments may be contemplated. . . . Local refiners have difficulty maintaining adequate crude supplies. Transportation restrictions, directives aimed at maximum shipments eastward disturb local crude balances. . . .

ADMINISTRATIVE.—Five OPC district chairmen told to nominate members to joint-facility subcommittees. Their function will be to adapt Directive 59, the pooling instrument, to other parts of country. Deputy Coordinator Davies envisages complete petroleum operations on pattern of one integrated company, as war-emergency measure. . . .

LEGISLATIVE.—Senator O'Mahoney's subcommittee hears added testimony that higher prices, more steel are essential elements to expand oil discovery. Government representatives, oil operators agree on basic points, differ on methods. Price Administrator Henderson outstanding exception who considers selected earning statements in conflict with industry's claims. . . . Attraction of venture capital, most agree, is surest way of stimulating drilling. . . . Bonus for discovery unacceptable to majority. . . .

MARKETS.—Product prices firm throughout country, except regular motor fuel on Pacific Coast. . . . Suppliers of fuel oil holding down interior deliveries, think relief for manufacturing adjustments may still result higher prices for burning stocks. . . . Crude buyers search for new connections at advantageous points. But relations between producers and purchasers mostly static. . . .

TRANSPORTATION.—ODT issues two new orders. One designed to withdraw small tank cars from East Coast service, replace them car for car with those of larger capacities. . . . Other order requires permit for all tank-car shipments less than 200 miles. . . . Permit applicants must certify to transfer of larger cars to eastern service, use of tank trucks in short hauls. . . . Formal application for steel to extend 24-in. line still pending, possibly awaiting more vigorous demand by eastern consumers or imminent adjustment of priority system. . . . Tank-car shipments to East Coast slump to 768,924 bbl. daily. Delaying wreck, other unforeseeable occurrences, slow up movement. . . .

RATIONING.—All distributors of fuel oil in 30 rationed states, wholesalers down to 1-qt. retailer, instructed to register October 20 and 21, with local boards. . . . OPA rejects PIWC recommendation for postponement of nation-wide gasoline-rationing date. Affirms November 22 as start . . .

operators relief from the 40-acre spacing requirements, drilling permits have more than doubled. M-68-5 became effective on September 1, and since that time, Mr. Swann said, production has increased some 20,000 bbl. a day.

William R. Boyd, Jr., chairman of the Petroleum Industry War Council and president of the American Petroleum Institute, agreed with Mr. Swann on the steel problem, stating that "we need more steel to do the job the petroleum industry is being called upon to perform."

Mr. Brown, the I.P.A.A. counsel, echoed the statement. He said that "our future ability to discover and produce more oil is going to be governed in a large degree by the steel we are able to get."

In concluding, Mr. Swann declared he was "amazed" that anyone is mystified that there should be a decline in discovery of new reserves in view of the fact that some 13,000 wells have been "eliminated" during the past year by M-68. If these had been drilled, he inferred, the usual increase in reserves probably would have been shown.

Mr. Brown discussed the "bonus" suggestion advanced by Mr. Henderson, and at the same time summed up the testimony of the I.P.A.A. witnesses. Main points in his summary were:

"Testimony before this committee has been presented to the effect that an increase in the price to be paid for crude petroleum is now needed for the following reasons:

"1. Much of the oil is now being produced at costs exceeding the price at which a ceiling has been placed by the OPA.

"2. To supply the necessary funds with which to carry forward an increased exploratory program, to discover new reserves of petroleum, and to provide the incentive to encourage operators to engage in such program.

"3. To supply funds sufficient to make possible the development of secondary recovery programs in areas where the present price is not sufficient to provide proper funds and incentive.

"4. To encourage and provide funds to carry on a research program to develop means of making available the immense reserves not capable of being recovered under present known methods.

"5. To provide necessary funds to enable the industry to keep in employment within the industry the trained and skilled employes in competition with industries not so necessary to our war effort.

Brown Summarizes Testimony

"Witnesses representing the I.P.A.A. believe that the suggestion offered by Price Administrator Henderson, that some form of bonus should be substituted for the suggested price increase is unsound and improper for the following reasons:

"1. The program suggests a revolution in our political philosophy which seems neither necessary or desirable. Since the suggestion seems to have been prompted by a desire to insure against excess profits that might result to some through the price increases suggested it seems proper to suggest that this situation is provided for through tax laws whereby the Government gets this excess profits through tax collections.

"2. The suggestion is untried in relation to this industry and its success uncertain.

"3. The time required to invoke such program might postpone the satisfaction of the requirements of this industry to such an extent as to render us unable to meet the actual needs for our war activities. This postponement could well become very expensive to our country in the lives of our people, as well as actual cash outlay.

"4. The novelty of the program suggests difficulties too numerous for our immediate comprehension.

"The suggestion of a few difficulties now apparent makes evident the confusion and discouragement that must follow its initiation.

"To whom would the benefits be made available?

"It has been suggested that it should not be available to the producer who is now producing at or above costs. Since most producers have both high and low-cost production, how will his share be apportioned?

"If it is to be used as an incentive for new drilling and exploration, will the funds be made available before the work is done or after? If after, where is the applicant to obtain the funds with which to drill? If before, on what basis are we to determine the amount allowed? The same questions are applicable to secondary-recovery work.

"If the program seems too confusing to encourage the operator whose life experience has been based on other methods, where will we get the experienced operators to fulfill our program?

"If we place the bonus 'at the bottom of the well' it has been suggested that new operators will be encouraged to enter the industry who will drill for the subsidy and not for oil.

"The political implications are interesting. It would be unfortunate if exploration were carried on for politics instead of for oil.

"The famous Russian industrial program is familiar to us all. They had such programs as this proposal suggests to our mind. With more potential hunting grounds than we have and with great need and abundant equipment Russia has been unable to greatly augment her supply."

Smaller Fields Found

William B. Heroy, OPC's director of reserves, told the committee that "it costs a lot more money to find a new gallon of oil than to save an old one," in discussing the need for conserving present reserves. At the same time, he declared the search for new reserves should be made "financially possible as soon as possible."

Mr. Heroy told the committee that the country's 75 largest fields produced only about 75 per cent as much oil during the first half of this year as in the same period of 1941.

Wildcatting, he said, has been not less successful during the past couple of years in finding new fields, but in finding new oil. That is, the fields found were not as productive as those found formerly.

Don R. Knowlton, director of production, Office of Petroleum Coordinator, told the committee that, while OPC recognized the need for using a minimum of steel and other critical materials, "we are also aware that the petroleum industry *must not fail* to produce the oil necessary as fuel and lubricants for our war machines.

"The ability of this nation to produce oil is a subject long misunderstood even by many persons active within the petroleum industry," Mr. Knowlton said. "An analysis of the nation's overall crude-oil productive capacity indicates that even now we are producing in excess of the most efficient rates."

There are only two general areas in the country where there now exists any additional efficient productive capacity which can be called upon, and this would not offset the amount "by which we are necessarily overproducing in other areas.

"Whenever it becomes necessary to start producing fields at a rate in excess of the maximum efficient capacity, it can only result in an irrevocable loss of petroleum reserves and in an excessively rapid decline of the productive capacities," the witness asserted.

Through application of Order M-68, Mr. Knowlton told the committee, "we have been able to eliminate the drilling of approximately 13,000 wells, and at the same time provide for the continued adequate development of our known crude oil reserves. Steel represented by this number of wells, he said, would be enough to make a half million 2-ton bombs.

Nevertheless, there is an "extreme necessity," Mr. Knowlton went on, "for discovering new crude-oil reserves, as well as for using every means to obtain maximum recovery of presently known crude-oil reserves, both through conservation and "all feasible types of secondary-recovery methods."

Herman Stabler, chief of the Conservation Branch, Geological Survey, like previous witnesses cited the effects of a general crude-price advance, but declined to say whether such an increase is justified at this time. It would, he said, encourage new exploration and discovery, make possible pressure-maintenance and secondary-recovery operations in fields where they cannot now be used, and would encourage development of substitute sources of petroleum, such as coal and shale.

Mr. Stabler discussed leasing on the public lands at length, and pointed out that one of the restrictions on drilling public lands which previous witnesses had said might well be eleminated in the interest of increasing discovery was the unitization requirement now in all public lands leases.

Value of Royalty Cut Debated

As for Senator O'Mahoney's bill to reduce all royalties on government lands to a flat 12.5 per cent, Mr. Stabler said it would furnish no incentive, as the amounts involved were too small. At the same time, he said he believed no particular stimulant should be applied to drilling of the public lands that was not applied to all lands, since, in ordinary times, government reserves should be held back longest.

Mortimer Kline, assistant general counsel for OPC, reported to the committee that one of the chief requests for relief the OPC is receiving from operations tells the story of an operator being all ready, willing and able to drill a certain lease, but being unable to get materials to begin operations, and at the same time being subject to the provision in the lease that he must either drill or pay the rental under standard Lease Form 88. Mr. Kline said that OPC might eventually make recommendations for legislation which would relieve the operator of this provision in certain cases, but added that any such legislation must fully protect the landowner as well.

Two Bureau of Mines scientists appeared before the committe to discuss the reserves of oil shale and of coal available for hydrogenation, as well as the processes for obtaining oil from these materials. Dr. Robert J. Kraemer, senior refinery engineer of the bureau, cited figures estimating that sufficient shale to produce 92 billion barrels of oil exists in the United States, principally in the Rocky Mountain region, and said bureau experiments indicate that oil can be produced from this at a cost of around $2 per barrel, with gasoline to be produced at a about 10.7 cents per gallon.

Dr. Arno C. Fieldner, chief of the bureau's Fuels Division, told of the coal hydrogenation experiments at Pittsburgh, and estimated that gasoline made by either of the two hydrogenation processes now known would cost around 16 to 18 cents a gallon.

"The time is not far distant," he said, "when synthetic fuels will be a part of our national industrial setup."

Revenue From Refinery Products Now Lowest Realized in 16 Months

By J. P. O'DONNELL

The aggregate value of refined products has been severely depressed by impact of the war on the petroleum industry. This summary reviews some of the factors contributing to the depreciated values of the oil industry's commodities and, by pointing out the reasons for the downward slope of curves on crude and refined products, suggests some of the steps which could be taken to effect a balance with other war materials and articles of commerce.

NEW YORK.—The combination of circumstances affecting the aggregate value of refined products has so depreciated it that the oil industry is now receiving less for the products from an average barrel of crude than at any time since May 1941. As a result of these circumstances the over-all value of refined products has declined steadily since the first of the year. A large and widening disparity exists between the value of these products and general wholesale commodity prices.

Factors accounting for the decline in the over-all value of refined products include declines in unit prices, the lowering of gasoline and the increasing of fuel-oil yields and the diminishing importance of certain refinery areas.

The factor of decline in unit prices is readily illustrated for example by data for the Gulf Coast area where the greatest concentration of refining capacity in the country exists and which, therefore, is the most important district in the composite picture of refined product values. The most valuable of the large quantity products of refining is gasoline. On the Gulf Coast the price of 72-74-octane gasoline, for example, has declined 12.65 per cent since the beginning of the year. The decline also affected less valuable products but in these instances depressing influences have been less marked. Kerosene prices have declined 3.125 per cent and No. 2 fuel oil 6.25 per cent.

Traceable to Excess Stocks

These declines were a result of the accumulation of excess stocks which, in turn, were occasioned by the interruption of coastwise tanker operations. The interruptions in tanker service were caused by losses to submarines and withdrawals to serve active war fronts, causes beyond the industry's control but for which it is being penalized.

The second contributing factor is reduced yields of gasoline worth, at the gulf, 5.25 cents per gallon for 72-74-octane grades, and increased yields of fuel oil worth 3.75 cents per gallon for the No. 2 grade and 85 cents per barrel, about 2 cents per gallon, for the No. 6 grade or Bunker C. The change in yields was undertaken to conform with an OPC directive which was necessitated by the restriction in demand for gasoline due to rationing and the increase in fuel-oil requirements. This factor will be of greater and more general influence if nation-wide rationing of gasoline goes into effect. Rationing will reduce the proportion of gasoline required while residual fuel-oil demands will remain unaffected.

The third factor contributing to reduced revenue for the industry is the diminishing importance of certain refining areas. This is true of the East Coast which is normally the third most important district from the standpoint of volume and more important than the Gulf Coast area from the aspect of average value of products at the refinery. Some comparable prices at the first of the year, for example, were: 72-74-octane gasoline, Gulf Coast, 6.125 cents; East Coast, 8 cents; No. 2 fuel oil, Gulf Coast, 4 cents; East Coast, 5.2 cents; Bunker C fuel oil, Gulf Coast, 85 cents per barrel, and East Coast, $1.35. This variation is even greater now because of the increase in East Coast prices allowed by the OPA to offset higher transportation costs. However, the increase has been insufficient to make up for reduced volume of production.

The last available report put East Coast runs to stills at 400,000 bbl. per day which compares with 668,000 bbl. in the week ended January 3. This is a decrease of 40 per cent in the volume of production. The increase in the refinery price of 72-74-octane gasoline, on the other hand, has amounted to only 15 per cent.

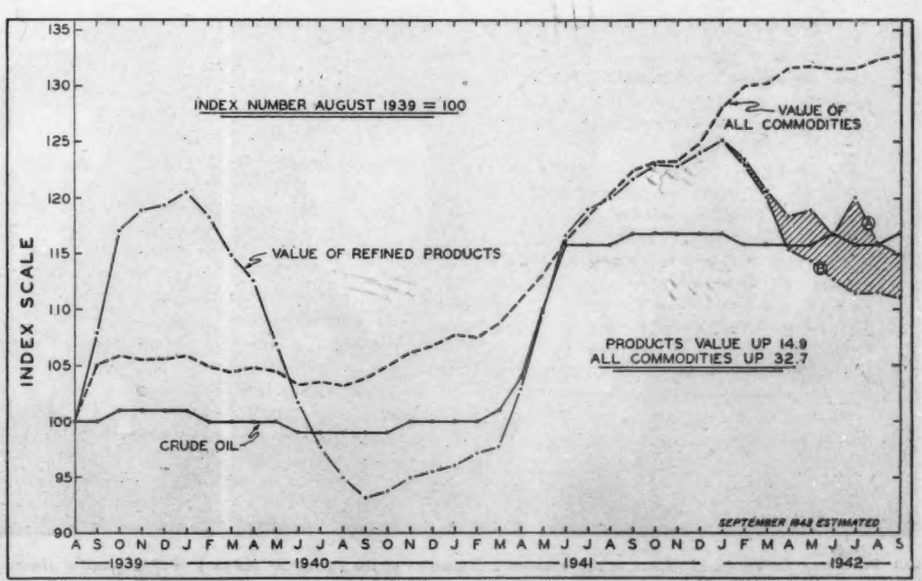
The accompanying graph compares the trend of all commodity wholesale prices as published by the Bureau of Labor Statistics with a composite United States crude-oil price and a composite of the value of petroleum products at the refinery. Since it is the intention to compare the course of these criteria during the war period, the month of August 1939, the last month before the outbreak of hostilities, is taken as a base or 100.

Product Values Fall Steadily

Several developments are strikingly apparent in this chart. Most striking is the steady decline in the value of refined-oil products in contrast to the consistent rise in the all-commodity wholesale-price index. The line indicating the trend in the value of refined products is divided after January to show the effect of the price increases allowed by OPA to offset the higher transportation costs. Line *A* shows the trend including the advances, while line *B* shows what it would have been had they not been allowed. The shaded area indicates the difference. This comparison reveals that these advances, since their last revision, accounted for an improvement of four points in the index of refined-products value, but that the decline since January has been 14.2 points, resulting in a net decline of 10.2 points.

Other developments in the value of refined products which stand out are the rapid gain following the outbreak of war, the marked reaction and the substantial rise in the latter part of 1941. The early rise was due to expectations of a greatly expanded export market which failed to develop and the reaction was due to that failure. The 1941 improvement was caused by the record demand for oil products in that year and, as such, was well founded.

The most important development indicated by the chart, however, is the persistent decline in the value of refined products through the first three-quarters of 1942. The trend will obviously impair the financial condition of the industry. In view of the extremely vital nature of oil, both in actual warfare and in the maintenance of production at home, impairment of the industry's ability to perform its task is an invitation to potentially serious trouble, not only during the war but certainly in the immediate postwar period. The prospect of nation-wide rationing of gasoline presages a further decline and emphasizes the acute need for the adoption of a policy which will correct this trend.



Values of crude oil and petroleum products fall behind curve on general commodities

Bonus for Increased Fuel-Oil Yield Urged at Texas Meeting

By ROBERT INGRAM

DALLAS, Tex.—Price adjustment for fuel oils, completion to the East Coast of the Texas-Illinois pipe line, and extension of fuel-oil and gasoline rationing were urged here last week by Dr. Robert E. Wilson, chairman of the petroleum economics committee of the Petroleum War Industry Council, at the twenty-third annual meeting of the Texas Mid-Continent Oil and Gas Association.

Dr. Wilson, who is president of Pan American Petroleum & Transport Co., explained the need for these steps in a "progress report" on the industry's adjustment to war conditions. He said they must be taken to insure continued service of the industry in filling the war demands of the nation.

He prefaced his remarks with a review of changes which have already taken place in transportation and refining.

Predicted Aviation-Fuel Shortage

"As I predicted a year ago," he said, "three major changes have taken place in petroleum operations. First, while usual retail sales of petroleum products to the public have taken a sharp drop, military and war needs have partly offset this loss and in a few months time may be expected to replace it fully.

"Second, demand for 100-octane gasoline has far exceeded early official estimates and both manufacturing and storage capacity for it is being expanded enormously.

"Third, was the appearance of the one bottleneck with which the petroleum industry has had to cope—transportation. This bottleneck, which is still a serious problem, has already introduced changes that may be properly called 'revolutionary.' That we have done as well as we have is due to a miracle.

"The big pipe line being built by the War Emergency Pipelines, Inc., from Texas to Illinois will not, as many people think, increase deliveries to the East Coast by its 320,000-bbl.-a-day capacity. This line does only part of the job. It takes the oil only 40 per cent of the distance to the East Coast and will add only 100,000 bbl. a day to the deliveries at the East Coast."

The argument against finishing the line that it takes more steel than required to build a like amount of tanker capacity is not valid, he continued.

"It is true that more steel is required for the pipe line than for the tankers themselves, but that does not take into account the sinkings and the tremendous amount of steel used up in convoy vessels and other tanker operations. Actually the pipe line will require only one-third of the power needed for tankers, only one-fourth of the money and one-eighth of the manpower."

Going on to the question of price, Dr. Wilson said that the need for price adjustment is becoming acute because of the change in refinery yields. Gasoline, although no longer a premium product from the standpoint of demand, is still the most profitable to the refiner. Yet refiners have already cut their yield of gasoline from 52 to 45 per cent, and will be called on to cut this even further.

"The result is," he continued, "that refiners are now getting 5 cents a barrel less for their product than they were a year ago, and when they increase the fuel-oil yield to the necessary point they will get from 11 to 13 cents less. Obviously this loss cannot continue indefinitely.

"In addition, in order to achieve the necessary yield of fuel oils without having gasoline running out of our ears, we will have to provide some incentive to the refiner to increase his fuel-oil yield. That incentive must not be inflationary."

He outlined three possible remedies: (1) Let the price of heavy fuel oils go up naturally; (2) allow a small increase in the price of fuel oil and then force refiners to increase their output; and (3) pay the refiner a bonus for his increase in heavy-fuel output.

"I recommend the third plan. The first two do not take into account the unbalance that would result from local peculiarities and type of crudes available to various refiners. The third plan would avoid much of the unbalance and would at the same time furnish adequate incentive for changing the yield. There is no need to pay the refiner extra to get him to turn out his usual amount of heavy fuel, but he must be compensated if he is to increase it."

Dr. Wilson spoke only briefly about gasoline rationing but said it was inevitable on a nation-wide basis.

Employers' Manpower Obligations

The convention business was confined to 1 day in contrast with the association's usual 3-day meeting because of the war. War problems also made up most of the speeches and one of the "heaviest" sessions of the day was that at which Lt. Col. Darnce B. Burns, chief of the Manpower Division, U. S. Selective Service, explained the responsibilities of employers in maintaining adequate operating personnel.

In answer to question, Colonel Burns emphasized that employers have a heavy responsibility with the manpower problem, and are expected to institute training programs to replace personnel lost in the draft.

Following the president's annual address by George Sawtelle, president of Kirby Petroleum Co., Houston, Tex., Joseph M. Weaver, reported that 5,000 carloads of scrap had been collected

Left: Dr. Robert E. Wilson, chairman of the economics committee of the Petroleum Industry War Council, is shown here (right) with Lee Kirkwood (left), and V. R. Shurmon of Fort Worth, Tex. Right: Hugh Roy Cullen, Houston, Tex., president of the Quintana Petroleum Co. (left), is shown here receiving the award for the most distinguished service rendered the industry by a member during the past year. The presentation is being made by T. E. Swigart, president of Shell Pipe Line Co., Houston, Tex.

by the scrap drive of the Texas petroleum industry.

D. E. Buchanan, Houston, director of production for District 3 of the Office of Petroleum Coordinator, reviewed the Texas oil-production program and advised the producers that even greater selectivity in crude buying was imminent.

Producers were cheered, however, by the remarks of Donald A. Knowlton, director of production under OPC, who said, "We think we have the opposition to a crude-oil price increase on the run."

Mr. Knowlton's statement came after he detailed the efforts of OPC to obtain ceiling adjustments from the Office of Price Administration. The matter has been laid before a subcommittee of the U. S. Senate which has been holding hearings, and Mr. Knowlton foresaw a favorable response to pleas from the industry for higher ceilings.

"Heretofore, the OPC has refrained from direct participation in the crude-price-increase controversy," he said, "but now our position has changed, and we believe that adjustment is not only justified but necessary for the future welfare of the nation. This was made clear when Sec. Harold L. Ickes appeared before the O'Mahoney committee.

"More oil fields are needed, and to get them more wildcats must be drilled. This means that the wildcatter must have some incentive, and a price incentive is the best. Proposed subsidies are not likely to do the job."

Distinguished service awards were given H. R. Cullen, Houston, president of Quintana Petroleum Co., an independent operator, and to John G. Pew, assistant to the vice president of Sun Oil Co., Dallas, Tex., representing major-company membership. These awards are made each year to the major-company official and independent operator judged to have rendered the most distinguished service to the industry during the year.

All officers of the association were reelected for another term with the exception of Brig. Gen. Walter B. Pyron, formerly vice president of the Gulf Oil Corp., Houston, who was replaced by L. P. Garrett, also vice president of Gulf. All directors were reelected.

Maj. Gen. Richard Donovan, commander of the Eighth Service Command, also addressed the meeting. He pointed out that for a unit of 100,000 men on maneuvers, daily requirements are 138,000 gal. of gasoline; 3,284 gal. of oil and 6,834 lb. of lubricants.

Left: John G. Pew, Dallas, Tex., assistant to the vice president of Sun Oil Co. (right), is shown here just after receiving the distinguished service award for a major-company representative member making the most outstanding contribution to the industry during the year. On the left is Jake Hammon, Dallas, independent operator. Right: A. J. Cunningham, Houston, Tex., president of Standard Oil Co. of Texas

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Joint Use of All Industry Facilities Is in Prospect

WASHINGTON, D. C. — Appointment of subcommittees on joint use of facilities by the general chairmen of all five OPC district industry committees has been asked by Deputy Petroleum Coordinator Ralph K. Davies.

This is a step toward eliminating competitive wastes in use of equipment by all branches of the oil industry throughout the country, and follows closely Directive 59 which requires pooling of rail-distribution facilities in District 1.

This is a further move to cartelize the entire oil industry and to make it operate like one big company during the war. Reports made by the subcommittees will be used by the coordinator's office in drafting a plan for pooling equipment in the production, refining, transportation, marketing, natural-gas, and natural-gasoline branches of the industry, and immunity from the antitrust laws will be obtained by means of a certificate to the attorney general.

The objective is to eliminate duplication of plants and operations in order to save materials and manpower and to obtain maximum production and distribution with a minimum of expenditure through consolidations. The committees are expected to draft plans which will view the operation of the industry as a whole and subordinate individual identities and considerations.

"The large opportunities for economy in the employment of labor and in the use of materials in the oil industry," Mr. Davies wrote the five chairmen, "lie in the direction of the joint use of physical facilities. The duplication of plant and of operation which had its full justification in normal times can scarcely be continued in the face of the ever more critical war demand for men and material. The war standard demands a maximum production with a minimum expenditure which can only be accomplished with a suspension of the customary relationships in favor of plans for the joint use and sharing of facilities by the various separate units of the industry.

Industry Reorganization Sought

"The Government now calls upon industry to reorganize, fully and quickly, in ways designed to achieve war aims. In the petroleum industry much has already been done, but much more remains to be done, and the purpose of this letter is to launch the undertaking in all directions where opportunity remains to increase efficiency and economy in operation—viewing the operation of the industry as a whole and subordinating individual identities and considerations for the time being. The sharing and joint use of facilities will be accomplished through the medium of intraindustry plans and agreements which will be submitted to this office for approval.

"In harmony with the foregoing I ask that you nominate at once the membership of subcommittees for the joint use of facilities, in production, transportation, refining, marketing, and natural gas and natural gasoline. These committees, when appointed, will devote themselves to the study of industry operations from the standpoint herein described and to the development of plans calculated to achieve the purposes herein set forth. Each such subcommittee should be composed of not more than nine members, nominations to be made to this office and approved before appointments are made by the appropriate functional committee chairmen.

"Immediately these committees are formed, I ask that they select as typical examples certain representative situations in their respective jurisdictions and make quickly an appraisal of the possibilities thereof, reporting promptly upon this experience."

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California Operators Ordered to Close In Well, Repair Pipe

WASHINGTON, D. C.—Violation of crude production restrictions of OPC Recommendation 19 is charged by Petroleum Coordinator Harold L. Ickes against Alliance Petroleum Corp. of Los Angeles, Calif.

In the first action of its kind the coordinator telegraphed the company to stop wasteful production of a well on a 1-acre lease in the Ventura field, or else action would be taken as provided by Recommendation 19. The production quota for this well is 150 bbl. per day but it is alleged to be producing 1,500 bbl. daily. The excess oil is being stored and no attempt has been made to sell it since the excess is "hot oil."

It is understood that the producer claims that split casing prevents shutting down the well to its quota. The coordinator's telegram directs the producer to correct the mechanical defects at once and promises that if it is necessary to close down the well for this purpose no allotments will be assigned to other wells in this zone during the shutdown period.

STATE CAPITALS...

ILLINOIS

CHIEF PROVISION of a new set of regulations issued October 10 by the state Division of Oil and Gas Conservation requires Illinois oil operators to apply for a $1,000 surety bond for each well drilled.

Operators who can file with the division a statement showing a solvent financial status are exempted from the rule, however. If the statement is not accepted by the division, the operator then must post a surety bond.

This has been required by law but was not enforced until the federal Government issued a ruling recently putting "teeth" into the statute.

Samuel F. Peterson, petroleum engineer for the division, said another new regulation requires oil operators to file notice with the division when a well is started and when it is completed which will enable the division to ascertain whether operators are complying with Order M-68-5 relative to spacing.

TEXAS

PROBLEMS OF OPERATORS concerning the shortage of critical materials, opening up the entire question of lease-quota proration, will be the subject of official Railroad Commission study at the state-wide hearing in Austin October 19. The hearing will be divided into two parts. At the morning session the regular monthly hearing on allowables, purchaser nominations and similar routine matters will be discussed. The special afternoon session will afford operators an opportunity to discuss the entire problem of conserving minerals, manpower, materials and related subjects.

Ernest O. Thompson, chairman of the commission, has advised operators to accompany their proposals for transfer of well allowables with maps showing the effect of such changes on adjoining properties.

The question of lease allowables, replacing the present system of allocating production quotas on a well basis, is becoming increasingly important. East Texas field operators are particularly interested in the possible relief available in changing the proration system because of their inability to obtain pumping equipment for more than one well on each 10 acres. The War Production Board, reflecting the recommendations of the Office of Petroleum Coordinator, have declined several applications for exceptions to M-68 filed by East Texas operators owning properties that are being gradually depleted to the pumping stage.

The OPC and WPB are obviously attempting to reduce the number of wells through which East Texas field production is recovered. The average density in East Texas is one well to 5 acres. Theoretical application of M-68 limitations would indicate that the number of East Texas field wells could be reduced 50 per cent although, from a realistic standpoint, this could not conceivably be attained. The average density includes many small leases on which wells occupy 1 acre or fractions of an acre.

Denial of pumping equipment for more than one well to 10 acres, however, would materially "thin out" the East Texas field and virtually compel the Railroad Commission to adopt lease allocations of production in order to maintain drainage on approximately the present basis.

KANSAS

CORPORATION COMMISSION on Monday issued an order boosting oil production 7,000 bbl. daily, a move described by Gov. Payne Ratner as essential to keep five refineries operating. The new order increases the state's crude-oil production to 296,000 bbl. daily, with the original order setting production of natural gasoline and condensate at 4,800 bbl. daily. The new total of 301,000 bbl. daily is an all-time high for the state.

THE WAR PRODUCTION BOARD has revised its order granting M-68 exception to part of the Peace Creek field in Reno County, Kansas.

"It has been determined," Amory Houghton, WPB director general for operations, advised the Kansas Corporation Commission, "that the use of material required to drill and complete in the Viola limestone at depths of approximately 3,800 ft., one or more wells which are to be located in that part of the Peace Creek field lying north and west of a line commencing at the southwest corner of the NW¼ of Section 2-23s-10w, or at a point directly west of such point and at the edge of such field, thence east to the southeast corner of the NE¼ of said Section 2, thence north ½ mile, thence east ¼ mile, thence north ½ mile, thence east ¼ mile, thence north ¼ mile, thence east ¾ mile, thence north ¾ mile, thence east ¼ mile to the center of Section 30-22s-9w, Reno County, Kansas, and thence north to the edge of the said field, is necessary and appropriate in the public interest and to promote the war effort, subject to the limitations stated below.

"You are hereby authorized to use the material required for the proposed operations described in the preceding paragraph, provided that:

"1. Each such well shall be allotted a drilling unit consisting of a quarter-quarter section upon which no drilling or producible well other than such well is located, and

"2. Each such well shall be drilled in the center of the SE¼ of the drilling unit upon which it is to be located unless such well would be located within 990 ft. of any other drilling or producible well, and

"3. Each such well which, if drilled in the center of the SE¼ of the drilling unit upon which it is to be located would fall within 990 ft. of any other drilling or producible well, shall be drilled in the center of the S½ of such drilling unit."

ACTIVE IN COMPACT . . .

Dan Howard, Oklahoma, and F. R. Frye, Michigan, chairman and vice chairman of the Research and Coordinating Committee at the October meeting of the Interstate Oil Compact Commission

ARKANSAS

THE OIL AND GAS COMMISSION last week ordered Carter Oil Co. to repair certain wells in the Magnolia field of Columbia County, Arkansas. Since early in May the Magnolia field has been threatened from within by corrosive action caused by the sour gas produced in the field.

A story concerning the studies of corrosion in the Magnolia and other southern Arkansas fields appears in the Engineering Section of this issue, starting on Page 31.

Last week's commission order instructed Carter to close six of its wells on the Booth, Garrett, Gunnells, Lewis, and Longino leases until they are repaired in accordance with the established procedure.

NEW MEXICO

MEANS OF STIMULATING discovery of new petroleum reserves will be discussed at a meeting of all New Mexico operators set for November 14 at Santa Fe. Arrangements for the meeting were announced last week by Gov. John E. Miles.

"I feel," said the governor, "that an incentive must be given the oil operators of New Mexico to encourage them to wildcat for oil, thereby increasing the underground reserves."

The chief executive did not amplify his statement as to what sort of incentive may be under consideration.

CALIFORNIA

SHELL OIL CO.'S desire to drill Gilmore Island in an attempt to develop deep Miocene production is again up for consideration. It was up once before but the Los Angeles mayor vetoed the measure and now the city council is reenacting the enabling legislation. Shell now has been granted permission to lay two pipe lines out of the Gilmore Island area in consideration for which the company will pay the city 4 1/6 per cent royalty on all oil and gas produced. The council also instructed its legal staff to prepare an ordinance annexing a portion of the Gilmore Island area to the city of Los Angeles.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Query Answered

"Why," asks OPA's Henderson at the O'Mahoney subcommittee hearings, "raise the price of every barrel of oil produced as a roundabout method of securing increased production?"

The price administrator, who continues adamant in his contention that petroleum prices generally should continue at their prewar levels, apparently thought he had answered his own question by vaguely suggesting a subsidy for wildcat operations plus a policy of selectively advancing crude-oil prices whenever in the opinion of the Government it will directly serve the war effort.

This reflects a viewpoint too common among officials of high authority at Washington, who have never been able to visualize the oil business as a great integrated enterprise in which every division is an essential and interdependent part of the whole. Specifically in this instance the nation's price czar is thinking of the efforts to find new oil as one thing and its production after discovery as something else.

Actually, as every student of petroleum economics and all operators know, wildcatting and other phases of exploratory work bear the same relationship to the production of oil as the planting of seed does in agricultural pursuits. No one has suggested, as a means of expanding the production of foodstuffs, that the Government subsidize planting and keep prices for the harvested crops at the levels of a year or 2 years ago. Farm production has expanded under the impetus of higher prices and no other incentive would have done the job.

The finding of oil comes from the application of many abilities. The utilization of scientific instruments is of increasing importance but in themselves these exploratory tools are not sufficient. Many new fields have been discovered this year and previously which are the result of studies by geologists, land departments, and individual operators extending over a decade or more in which most of the information was obtained from the logs of producing wells and dry holes.

There are those who have the specialized ability of pooling acreage and carrying on other cooperative activities which permit the equitable distribution of exploratory hazards. Furthermore, no analysis of how this country has found its oil would be complete without considering the contributions that the supply companies and banks have made.

These are not talents and experience which the Government can buy at the market places. They are an integral part of a going industry which has made the needed speculative capital for exploratory work available because of the profits from existing operations and because of confidence as to the future. It is no more possible to separate the finding of oil in war or peace from its production than it is to separate the design of a new manufacturing operation from the operation itself.

The selective pricing plan is equally untenable. Crude-oil values at the wells are determined by refining characteristics and distances from markets. A confused and ineffective industry will be the inevitable result of a pricing policy which discriminates between fields and types of operations.

The oil industry's representatives at the O'Mahoney hearings again presented a clear case for price consideration comparable to that given to other essential enterprises. The fact was stressed that recent production has greatly exceeded the discovery of new reserves, a development which weakens the foundation of the war and postwar plans of the United Nations. The answer to OPA's query is an upward price adjustment which will justify this industry in carrying on the most intensive and extensive search for new oil in its history.

Future Rubber Policy Second Only to Winning Present War

By ARCH L. FOSTER

WICHITA, Kans.—America's chief postwar problem is that of deciding whether to employ natural rubber, with its political and military hazards and its geographical handicap, or to continue to produce its own rubber by synthetic means, which by that time will be perfected and operating, technologists of the Western Petroleum Refiners Association were told in session here October 9.

Whether to risk national life and independence by returning to foreign rubber or to seek more invulnerability both in military and economic senses by maintaining these supplies within continental borders, is the question, second in importance now only to winning this war itself, they were told.

The oil industry's part in the synthetic-rubber program both present and future, refiners were told, may be a system of collection of relatively small quantities of butadiene, butene and other intermediates from many large and small refineries and concentrating and processing these composites at central rubber-making "creameries." The system was likened to that of a modern creamery, collecting small quantities of raw milk from innumerable farm producers and processing the aggregate for the finished products to meet commercial requirements. One of the standard products of the refineries of this country may be a fraction, taken from motor and aviation fuel-cracking units or from other plant streams, concentrated by well-developed processes to meet standardized specifications and shipped to huge central rubber-synthesizing factories where it will be processed to supply the tires and industrial rubber products indispensable to present civilization.

The natural-gasoline industry is in position to supply a great part or, if necessary, all the raw materials needed for the prodigious infant synthetic-rubber projects and a large part of the aviation superfuels so critical to successful prosecution of the present war, Dr. Frank H. Dotterweich, consultant to the Natural Gas and Natural Gasoline Division of the Office of Petroleum Coordinator, emphasized in discussing the extreme importance of natural gasoline in our present economy. Dr. Dotterweich, coauthor with P. M. Raigorodsky who is assistant director of that OPC division, presented their joint paper on "The Importance of Natural Gasoline and Its Derivatives to the Synthetic-Rubber and Aviation-Gasoline Programs." They explained in some detail the operation of the Wulff process now under study for the production of acetylene, butadiene and other critical materials; the Schoch process for producing acetylene, butadiene and carbon black from hydrocarbons by electrical discharge methods, and the comparative properties of carbon and other blacks from petroleum and natural gas and their various uses and applications in rubber making.

Discussion of the acetylene (Wulff) process brought out the information that at present some 300,000 lb. of acetylene-making capacity annually is under construction. The production of acetylene is of extreme importance in making war materials as well as for products useful in more peaceful applications. Dr. Dotterweich explained in detail the operation of the Houdry split-phase process for preparing butadiene from butanes. Six reactors are employed, fitted with monolithic lining, each reactor being in a different phase of the operation at any given time, these phases including reaction, purging, regeneration of the catalyst. A butane-butene mixture is charged to the reacting unit, where it is combined with butene-butadiene recycle which has already passed through one reactor and from which practically all the butadiene has been removed. Passage through the reactor forms more butadiene which is removed by an absorption medium in a second part of the process and from which medium the diolefin is separated in a desorber unit, recycling the butane-butene with residual traces of butadiene to the reactor. One interesting step is that of returning some of the desorbed butadiene to the bottom of the absorber to reduce to a minimum the absorption of butene. Inhibitors are added to the concentrated butadiene to prevent its polymerization.

The introduction of two heat exchangers, transferring heat from the overhead product to the incoming charge reduces the required refrigeration capacity from 1,600 tons to 900 tons, the speaker stated. The Houdry unit may also produce butene by changing the operating condition, it was pointed out. (An extended extract of this paper will be published in the October 22 issue of The Oil and Gas Journal.)

Channel carbon black is graded into nine particle sizes. Furnace blacks are produced in particle sizes larger than those of channel black, while lamp black is made in still larger particle size, Dr. Dotterweich explained. The smaller the carbon black particle size used, the harder the rubber produced, he stated, while larger particles form correspondingly softer rubber. Much research work is being carried out to determine the proper proportions of different particle sizes to employ in synthetic rubber to obtain the desired properties in this "made-to-order" rubber. The harder the rubber the greater the heat production in service, the technologists were told. Proper correlation of black particle size with the properties required in the rubber is necessary for satisfactory products. The use of larger particles may aid in reducing the naturally greater hardness of synthetic rubber, it is believed. Even lamp black may be employed in some synthetic rubber for special purposes, in the opinion of rubber technologists.

The Schoch process for preparing acetylene, butadiene and carbon black from natural gas is being pushed intensively, it is understood from open forum discussion at the meeting. As much as 9 lb. of black per 1,000 cu. ft. of gas has been made.

Large savings in aviation fuel has been accomplished by the use of special carburetors and propane as fuel in the breakin of aviation motors, discussion at the meeting brought out. From 90 to 200 gal. of 91-octane and 100-octane fuel is saved per engine during the running-in period by the use of propane and this item alone will reduce by thousands of barrels annually the requirements for these critical fuels, the speaker said.

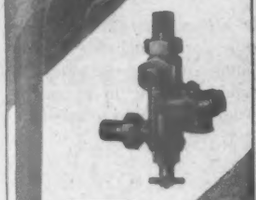
The major problems in furnace design are those of obtaining suitable materials, H. O. Johanson of the M. H. Detrick Co. stated. Shortage of copper and thus of Mehanite castings for refractory supports has crippled progress, and experiments are being carried out to find suitable substitute materials. Radial brick and concrete stacks are being built wherever possible to relieve demands for steel. Mr. Johanson told of one refiner who welded together two 10 by 20-ft. tanks—after removing the bottoms—to make a 10 by 40-ft. stack for emergency construction.

Chemistry of Rubber Discussed

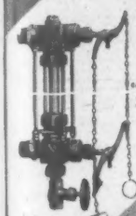
THE chemistry, composition, and the fundamentals of the synthesis of rubber are not new, the technologists were told by Arch L. Foster, formerly technical assistant for Phillips Petroleum Co., and now associate editor of The Oil and Gas Journal. Isoprene was first isolated by destructive distillation of rubber about 1860. The Germans made a very imperfect but usable brand of rubber from dimethylbutadiene during the first World War, and have studied the problem intensively during recent years. The Russians have been making synthetic rubber from alcohol and from native plants for several years and are using mostly synthetic rubber at present. Methods for producing all the necessary ingredients of rubber are known, and the "bottleneck" of the problem now is to erect the required capacity to meet our rush military and civilian needs within the time available, the speaker stated.

The number of possible new materials useful in the synthetic rubber of tomorrow is large, and the amount of research work required is staggering. Diolefins of more than four carbon atoms are very promising as rubber intermediates and their effect on rubber properties is now being studied. The pentadienes, especially isoprene and piperylene, are particularly promising and perfection of their synthesis and adaptation to rubber making may affect the situation very importantly. The major problems involving vulcanization and processing of synthetic rubber vary in degree but not necessarily in kind from those which have been well solved for natural rubber. Prospects of successful rubber synthesis on a large scale both are bright and certain. Trepidation over the possibility of producing a million tons of rubber annually from petroleum "plantations" has no basis, Mr. Foster stated.

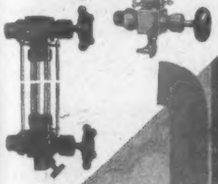
QUALITY UNCOMPROMISED


Automatic Injector

Ejector, Syphon or Jet Pump


"Navy Type" Liquid Level Gage

"Safeguard" Automatic Liquid Level Gage

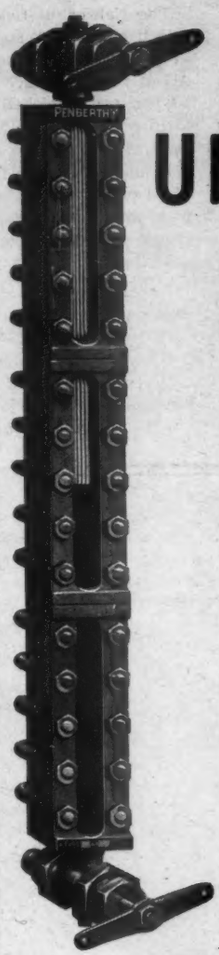

"All-Iron" Automatic Liquid Level Gage

Gas Engine Lubricator

Snap Lever Oiler

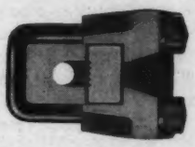
Plain Brass Oil Cup

Plain Compression Grease Cup



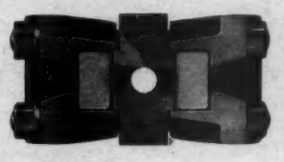
PENBERTHY *Reflex* DROP FORGED STEEL LIQUID LEVEL GAGES

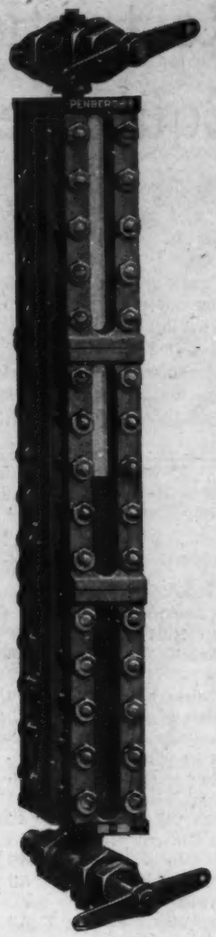
Liquid shows black — empty space shows white. Preferred wherever liquid level must be easily and positively visible . . . and when liquids are under high pressure or at high temperature.



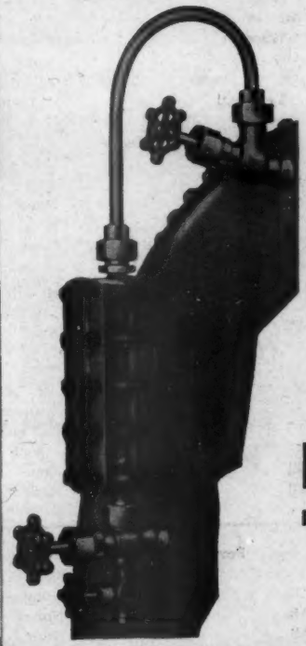
PENBERTHY *Transparent* DROP FORGED STEEL LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures, and/or temperatures. Construction is exceptionally rugged . . . similar to Reflex types.





Penberthy Liquid Level Gages

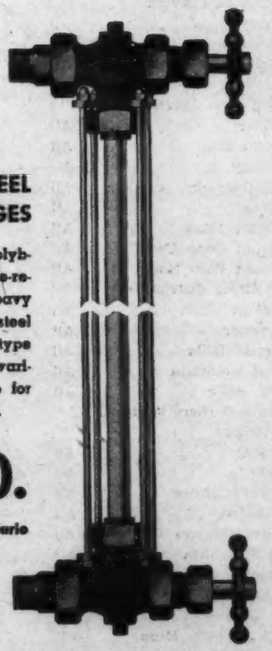


PENBERTHY *Reflex* WATER GAGE SET

Water shows black — steam shows white. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler.

PENBERTHY DROP FORGED STEEL LIQUID LEVEL GAGES

Made of Chromium-molybdenum alloy temperature-resisting steel, extra heavy throughout. Stainless steel trimmed tubular glass type gages also available in various other metals suitable for practically all conditions.



PENBERTHY INJECTOR CO.

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PENBERTHY PRODUCTS

Screw Plunger Grease Cup

Spring Compression Grease Cup

Automatic Electric Sump Pump

Automatic Cellar Drainer (Water or Steam Operated)

Dipless Air Cock

Restrictions Are Modified on Equipment in California

WASHINGTON, D. C.—Anticipated for several months, the order exempting certain California fields from selected provisions of Conservation Order M-68 has been finally approved and made public. It is M-68-3, and under it California operators are authorized to use materials to rehabilitate old wells under certain conditions in specified fields.

Petroleum Coordinator Ickes urged the oil producers of California to act immediately to take full advantage of modifications so that oil supplies for the Pacific war can be delivered when and in quantities needed.

The order will make materials available for the rehabilitation of several hundred wells in 84 designated fields. It will permit operators to deepen, plug back, recomplete, and otherwise "rework" wells in specified fields.

Deputy Coordinator Davies has recently estimated that demand for fuel-oil base California crudes will exceed 300,000 bbl. daily before this year's end, and that next year it may be higher.

The California fields affected by M-68-3 were selected by OPC after a comprehensive survey of the heavy-oil situation in California industry. All of them produce crude yielding in excess of 50 per cent finished fuel oil. From some, the yield is more than 75 per cent. Most of it is less than 24° gravity.

In many of these fields, OPC says, the tops of these producing horizons are only 500 to 600 ft., thus minimizing quantities of critical materials required in the reconditioning operations.

Text of the order follows:

(Supplementary Order No. M-68-3)

General exception authorized by Paragraph (*c*) (10) of Conservation Order M-68, as amended

Whereas, the petroleum industry of the State of California is required to provide crude petroleum, immediately and for an indefinite period, from

(Continued on Page 92)

EXHIBIT A—Part 1

1 Region and field—	3 Formations or zones included	4 Formations or zones excluded	5 Depth limitation (feet)
Los Angeles Basin region:			
Beverly Hills	All	None	3,500
Los Angeles	All	None	3,500
Puente	All	None	3,500
Salt Lake	All	None	3,500
Whittier	All	None	3,500
Yorba Linda	All	None	3,500
San Joaquin Valley region:			
Belridge North—Shallow	All	None	3,500
Belridge South—Shallow	All	None	3,500
Coalinga West	All	None	3,500
Coffee Canyon	All	None	3,500
Devil's Den	All	None	3,500
Kern River	All	None	3,500
Lost Hills	All	None	3,500
Midway West	All	None	3,500
McKittrick district:			
Cymric	All	None	3,500
McKittrick	All	None	3,500
McKittrick Front	All	None	3,500
Temblor Ranch	All	None	3,500
Mount Poso district:			
Baker	All	None	3,500
Dominion	All	None	3,500
Dorsey	All	None	3,500
Dyer Creek	All	None	3,500
Glide	All	None	3,500
Mount Poso	All	None	3,500
Mount Poso East	All	None	3,500
Mount Poso North	All	None	3,500
Poso Creek district:			
McVan	All	None	3,500
Premier	All	None	3,500
Pyramid Hills	All	None	3,500
Round Mountain	All	None	3,500
Terra Bella	All	None	3,500
Santa Barbara-Ventura region:			
Bardsdale	All	None	3,500
Conejo	All	None	3,500
Elsmere Canyon	All	None	3,500
Ex-Mission	All	None	3,500
Hopper Canyon	All	None	3,500
Lion Mountain	All	None	3,500
Modelo	All	None	3,500
Newhall	All	None	3,500
Rice Canyon	All	None	3,500
Santa Barbara Mesa	All	None	3,500
Sespe Canyon	All	None	3,500
Sisar-Silverthread	All	None	3,500
Shiell's Canyon	All	None	3,500
Summerland	All	None	3,500
Tapo-Eureka Canyon	All	None	3,500
Temescal	All	None	3,500
Timber Canyon	All	None	3,500
Tiptop-Fresno Canyon	All	None	3,500
Torrey Canyon	All	None	3,500
Wiley-Towsley Canyon	All	None	3,500

Part 2

1 Region and field—	3 Formations or zones included	4 Formation or zones excluded	5 Depth limitation (feet)
Los Angeles Basin region:			
Brea-Olinda	All	None	5,500
Coyote East	All	None	5,500
Coyote West	All to base of "99" zone	All below base of "99" zone	5,500
Dominguez	All Pliocene	All Miocene	5,500
Huntington Beach—Old	All to base of lower Ashton	All below base of lower Ashton	5,000
Huntington Beach—New	All to base of "Main" zone	All below base of "Main" zone	5,000
Inglewood	All Pliocene	All Miocene	5,500
Kraemer	All to base of lower Kraemer	All below base of lower Kraemer	5,000
Long Beach	All Pliocene	All Miocene	5,800
Montebello	All to base of Zone 4	All below base of Zone 4	5,500
Richfield	All to base of lower Kraemer	All below base of lower Kraemer	5,000
Seal Beach	All to base of lower Wassom	All below base of lower Wassom	5,800
Torrance-Redondo	All	None	4,500
Wilmington	All to base of lower Terminal	All below base of lower Terminal	4,500
San Joaquin Valley region:			
Coalinga East	All to top of Kreyenhagen shale	All below top of Kreyenhagen shale	4,500
Edison	All	None	4,500
Elk Hills	All	None	4,500
Fruitvale	All	None	4,500
Kern Front	All	None	4,500
Midway-East	All	None	5,500
Midway-Lakeview	All above top of Reef Ridge shale	All below top of Reef Ridge shale	5,500
Wheeler Ridge	All	None	4,500
Williams	All to top of Eocene	All below top of Eocene	4,500
Santa Barbara-Ventura region:			
Capitan	All to base of Vaqueros	All below base of Vaqueros	5,500
Rincon	All to base of Miley zone	All below base of Miley zone	5,500
South Mountain	All	None	5,500
Sulphur Mountain	All	None	4,500

Part 3

Los Angeles Basin region:			
Alamitos Heights	All	None	8,500
El Segundo	All	None	6,500
Playa del Rey	All	None	6,500
Turnbull Canyon	All	None	6,000
San Joaquin Valley region:			
Buena Vista	All	None	4,500
Mountain View	All	None	7,500
Raisin City	All	None	6,500
Union Avenue	All	None	6,500
Santa Barbara-Ventura region:			
Aliso Canyon	All Pliocene	All Miocene	6,500

Note: Column 2, deleted in tables, designates the county in which each field is located.

Independent Producers' Role In Wartime To Be Analyzed

CRITICAL analysis of the independent producer's difficulties in fulfilling his wartime responsibilities will be made at the annual meeting of the Independent Petroleum Association of America in Wichita, Kans., October 19, 20 and 21. Necessity for an appraisal of conditions was emphasized this week in a statement by Frank Buttram, Oklahoma City, Okla., president of the association, who urged all independent operators to attend and participate in the committee and general meetings at the convention.

"The problems are varied and complex," Mr. Buttram said. "We need all the ideas and the opinions. There will be appropriate place for their expression, in committee meetings and in forum discussions. That has always been our method of procedure."

This year's meeting, due to the general speeding up of all activities, will occupy 3 days, 1 day less than usual. The first day, Monday, will be devoted to committee meetings and to the annual meeting of the National Stripper Well Association, which is a federation of state and regional associations that include in their membership considerable numbers of operators of small wells.

The preliminary program lists an imposing array of speakers. Petroleum Coordinator Harold L. Ickes is to speak at the annual banquet of the I.P.A.A., Wednesday evening, October 21. William B. Stout, whose creative vision has resulted in many advancements in the aviation and automotive industries, will speak at the Wednesday luncheon. Gov. Payne H. Ratner, of Kansas, will address the audience at the luncheon on Monday, October 19. This occasion will be under the joint auspices of the National Stripper Well Association, the Kansas Independent Oil and Gas Association and the general Independent Association.

The first general session of the Independent association will be held Tuesday morning, October 20, and the speaker will be one who will discuss a subject that is of prime importance to the producing industry, supplies and equipment. Greer W. Orton, OPC director of materials, will be the speaker. This event of the program is planned to be as thorough coverage of the subject as time will permit. Mr. Orton will outline the situation and then will invite questions.

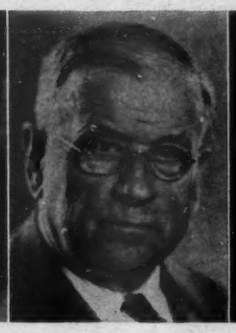
The Tuesday luncheon will be the occasion of the annual address of the president of I.P.A.A., and Mr. Buttram will be the only speaker at this time. In the afternoon meeting of Tuesday, the annual reports of H. B. Fell, executive vice president, and Russell B. Brown, general counsel, will be given, and these will be followed by open-forum discussion.

Reports of committees in the Independent association have always been the basis of policy and program of activity. The committees this year will survey and report on all the major phases of the producing industry. Producers who attend the meeting and who are not members of any committee are urged to attend the meetings of those in which they are most interested and contribute their suggestions and questions. The reports of the committees will be formed at these sessions and will be presented in the Tuesday morning and afternoon and Wednesday morning general meetings of the association.

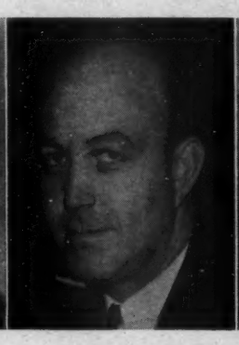
One of the outstanding entertainment features of the meeting will be the party Tuesday evening at the Cardwell Manufacturing Co. plant. This party will be held in the one evening that was open.

Final arrangements for the meeting were being completed this week at the Tulsa headquarters of I.P.A.A. and by the Wichita committee. C. E. Buchner, executive manager, Tulsa, has been working with all committees on arrangements for several weeks. The general arrangements committee is headed by Edwin N. Carlson, Wichita, vice president of the I.P.A.A. for Kansas and president of the Yarnell-Carlson Oil Co. E. C. Moriarty, Wichita, a member of the I.P.A.A. executive committee, is cochairman of the general arrangements committee and vice president of the McPherson Drilling Co.

FRANK BUTTRAM



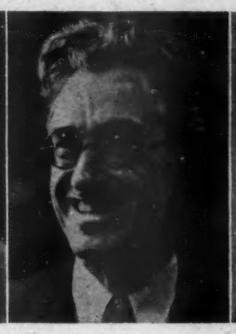
HAROLD L. ICKES



GREER W. ORTON

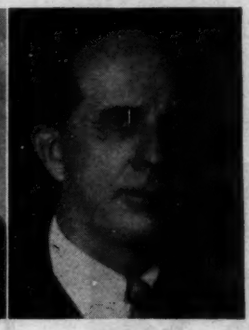
GOV. PAYNE RATNER

C. E. BUCHNER



WILLIAM B. STOUT

E. H. CARLSON



E. C. MORIARTY

Fifteen Latin-American Countries Pledge Rubber

WASHINGTON, D. C.—Fifteen republics and British colonies of Latin America have agreed to sell exclusively to the United States all crude rubber produced above essential domestic needs, at the same time taking definite steps to expand production.

Signed agreements implement this government program to get every possible pound of crude rubber from areas not cut off by war.

The countries which have signed include the American republics Brazil, Peru, Nicaragua, Costa Rica, Colombia, Bolivia, Ecuador, Honduras, El Salvador, Mexico, Guatemala, and Panama, and the British colonies Trinidad-Tobago, British Guiana, and British Honduras. Similar agreements are being negotiated with Venezuela, Dutch Guiana and the Windward Islands, in the Western Hemisphere, and with Liberia. The rubber development work in Brazil and Peru was initiated by the Rubber Reserve Co. before the final responsibility for all import programs was centered in the Board of Economic Warfare by the president's executive order of April 13, 1942.

The Baruch rubber-survey committee estimated that probably total United States importation of natural rubber would be about 53,000 tons for the 18 months period from July 1, 1942, to December 31, 1943. The rubber agreements run through 1946, but no volume estimates are available beyond 1943.

W. P. Z. German Heads Committee On Secondary-Recovery Study

Under the leadership of Burdette Blue, president of the Kansas-Oklahoma division of the Mid-Continent Oil and Gas Association, delegates from every producers' association in the two states met at Tulsa last week for the purpose of considering legislation dealing with secondary recovery.

A subcommittee, headed by W. P. Z. German, Skelly Oil Co., was formed to gather preliminary information and to report back to the main committee early in November.

Legislation to permit the formation of secondary-recovery projects without having to secure the consent of every person involved and which would, at the same time, protect the interests of every lessee and royalty owner in the field was a topic of discussion at the Chicago meeting of the Interstate Oil Compact Commission.

It was generally agreed at the meeting of the Kansas and Oklahoma operators that much of the estimated 750,000,000 bbl. recoverable by secondary-recovery methods in those states would be wasted underground if suitable legislation was not enacted. It was also felt that, failing in the introduction of these methods by the operators under state control, the federal Government might assume charge of the situation in order to prevent this wastage.

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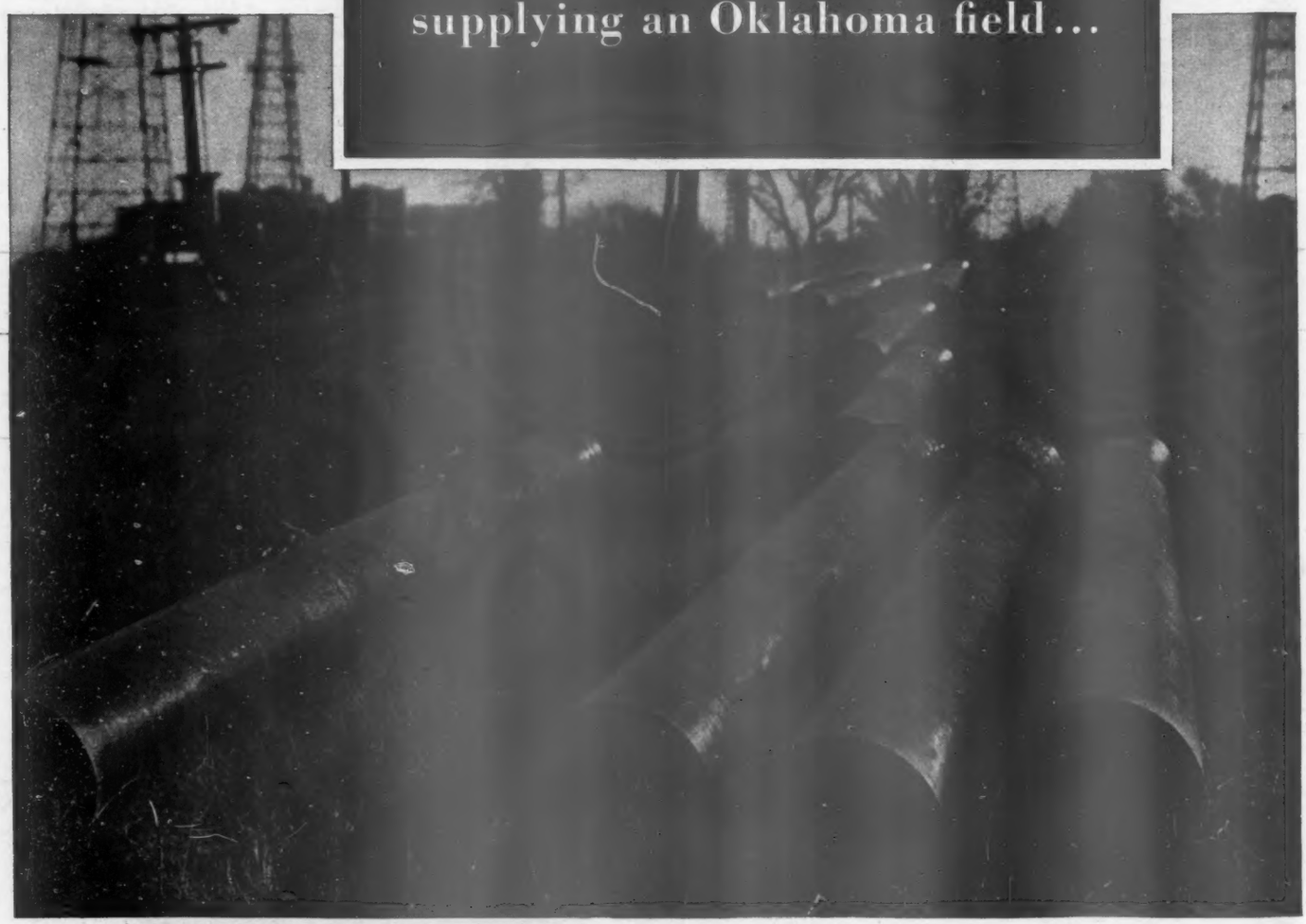

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Adjustment of Natural Gas Balances Big Task Facing Postwar Period

By J. FRENCH ROBINSON
President, East Ohio Gas Co.

Transportation of liquefied natural gas in cargo vessels with insulated hulls is a distinct probability in postwar operations of the industry, the author declares in this digest of his paper which was presented last week at the annual meeting of the American Gas Association in Chicago, Ill.

Major characteristics of the natural-gas industry will be retained, Mr. Robinson believes, but he envisages sharper competition. Mr. Robinson served the past year as chairman of the Natural Gas Section, A.G.A., and is chairman of the District 1 functional committee for natural gas and natural gasoline.

ONE unassailable rock we have to stand upon, that is, the known amount and extent of natural-gas reserves in the United States at the present time. Known reserves of natural gas in the United States are estimated at 86 trillion cubic feet. It becomes necessary to know how much of that will be left for postwar use. This involves the war's duration, a cloudy calculation indeed. The war's duration and the as yet unmapped extent of our "war effort" are uncertainties and must be clearly marked as speculative in any calculations we make, and yet we have to make them.

We know, also, the geographical distribution of these reserves within the United States and the extent of the widely separated areas which can be depended upon to produce natural gas. Luckily, too, we have a geographical chart of requirements. We know that, unfortunately, the areas of greatest demand are areas of dwindling supply and that, in fact, the requirements of natural gas are in accelerating dislocation with regard to the sources of future supply.

I believe that another postwar fact which we can safely include in our consideration of natural-gas supply and requirements after the war is the permanence of our present economy of distribution, at least in principle. This is the economy which sets up but does not mark off the five natural-gas districts which are now the framework of our industry's operations. They are natural divisions of supply and utilization. And they are keyed to each other, and all for each other, into a central coordination system which relates an entire industry to an entire nation.

Taking 1941 as our basis, we find one of the present natural-gas coordination districts with known reserves of natural gas estimated at 65 trillion cubic feet, or 76 per cent of the total. Another district and across the continent from that one, is a district with 5 trillion 250 million cubic feet of known reserve natural gas supply, or 6 per cent of the total. Yet the former district, with 76 per cent of the known national reserve supply, in 1941 utilized only 1 trillion 300 million cubic feet, or 46 per cent of the total annual consumption, while the latter district, with only 6 per cent of the known national reserve, utilized 500 billion cubic feet or 18 per cent of the national total. The answer to this problem is arithmetically and instantaneously reduced to geographical terms, and these are simple terms of transportation.

All boiled down, natural-gas requirements after the war will make still more acute the problem of balancing supply and demand geographically. The machinery for this, luckily, already exists and will have been improved and perfected in the ease and speed with which it functions. Experience is doing that now. It is obvoius, also, that the successful integration of our industry with other industries effecting the mutual exchange of critical materials needed, will also be retained as a profitable lesson taught by this war.

New Balances Probable

Seasonal balances nationally by districts and by companies in the postwar period which we all hope we will soon emerge into, will be sought by new methods in the increased use and development of present methods. Taking the district with which I am the most intimately familiar, District 1 or the Appalachian area, the seasonal unbalance can be quickly gaged by one figure. This is a gap of 100,000,000 cu. ft., between the present peak-day requirement of 2,600,000,000 cu. ft. and the maximum available supply on any one day. Within this district, as well as within others which are in a similar embarrassment, the discrepancy between demand and supply is at present reduced to its minimum by all the means that are known. This figure, 100,000,000 cu. ft. on a peak day, is the discrepancy between supply and demand after the supply has been raised to its maximum. We are all familiar with these efforts and we will become more and more familiar with them.

Chief of these methods of countering a peak-day shortage is, of course, off-peak storage of gas, both underground and by repressuring pools that are nearly depleted and by the storage of liquefied natural gas in aboveground containers. In District 1 the underground storage amounts to 85,000,000,000 cu. ft. which can be withdrawn at the rate of 600,000,000 cu. ft. per day for a few peak days. Aboveground storage of liquefied gas is, of course, much less, amounting to, at the present time, 180,000,000 cu. ft. This is in course of augmentation by the equivalent in liquid gas of 120,000,000 cu. ft. of gas. The advantage of liquefied storage is its greater flexibility and the greater speed with which it can be made useful in the distribution lines. I wish to repeat that the 100,000,000 cu. ft. of shortage on a peak day is the shortage after all such methods have been used.

War to Reduce Reserves

War, of course, will play havoc in the depletion of our national reserves of all resources, and gas can be no exception. Both supply and requirements of natural gas will, however, be vitally affected by this war through the enforced practices of conservation, in every single phase of the industry, from production clear through to increased efficiencies of utilization. The nation will never recover from the terrific impact on our material resources which this war is causing. All we can do is to carefully husband what is left us. Intensification of all research and engineering and educational effort for conservation all along the line must be included in any consideration of postwar requirements and supply. The three are inseparable.

I have predicted, and it is perfectly safe to predict, that the future holds for us as the nation's suppliers of natural gas a period of intensified use of natural gas and an improved method of transportation by which the advantages of natural gas are extended to more people, and a better geographical balance between supply and demand will as a result be brought about. This, of course, is transportation.

It is also safe to predict, because it was coming about before we got into the war, competition between natural gas and other fuels and forms of heat, the like of which our industry has never seen.

In this matter of competition, we are always at grips with coal for house heating, and we must remember that coal combustion equipment has received a tremendous amount of research attention in the past few years with the resultant improvements which might be expected. We can look forward to more of this. We can also look forward to the fact that house heating more and more will be our mainstay for consumption in volume. Nor is it entirely out of the picture to envisage new forms of heat and new methods of using heat which is now abundant but lacks means of practical application.

If anybody thinks that things are not moving fast and going places in natural gas, he should be reminded that we are already talking of natural gas by shipload in cargo ships, exactly as if two ships were tied to the same pier and one was loaded with cotton and the other was loaded with gas.

The explanation, of course, is liquefied gas. The mechanics of transporting liquefied gas by water are already completed. Its economy, like every other economy today, is not subject to definite chart. Naturally, cost factors being favorable, natural gas will be transported much the same as fuel oil, the natural gas "tankers" having insulated hulls. Much more than a conjectural advantage of this transportation is the belief that unpreventable leakage by evaporation of the liquefied natural gas would furnish the motive power to propel the ship.

Hunter and Brown Led Battle Against Inimical Tax Change

SMOKE of the battle over the depletion allowance and the intangible drilling clause is beginning to clear although there is still a possibility that both may be subjected to additional attack on the floor of the Senate. Secretary Morgenthau has singled out these two parts of the tax law for his personal attention, and has made attack after attack upon their justification. Several times when the industry deemed the matter closed as far as current events were concerned, it has been startled with the news that some Treasury Department experts have wrangled another hearing from a congressional committee, and have taken another whack at the problem in executive session when the industry was not present to defend itself. The presentations of the industry have always been made in open hearing.

J. C. HUNTER

RUSSELL B. BROWN

This did not happen by accident. It was the result of broad nation-wide activity upon the part of the petroleum industry, and tireless work upon the part of the industry's general depletion committee headed by Russell B. Brown, general counsel of the Independent Petroleum Association of America, and J. C. Hunter, president of the Mid-Continent Oil and Gas Association. They are co-chairmen of the general committee. Too much credit, say those who have watched the battle, cannot be given them for their organization work in enlisting the active participation of 41 oil and gas associations (which represented all sections of the country) and hundreds of oil men in this cause. Due recognition must be awarded their exceptional ability in meeting the urgencies of rapidly changing conditions. Unless another last-minute surprise appearance of the opponents of these two allowances is made, depletion is safe—for this year, and for no longer—because as a high-ranking representative of the Treasury recently said to Mr. Brown, "We'll get you yet, if it takes 10 years."

The industry was exceptionally fortunate in having at least three conspicuous supporters in the Congress. In the House of Representatives (where tax matters must originate) Rep. Wesley E. Disney, Tulsa, a member of the ways and means committee, has successfully led the fight. To many other members of both House and Congress who participated in the fray, the industry is also indebted. Cochairmen Brown and Hunter have been active in depletion matters for several years, although this is the first time that a committee representative of the entire industry was formally organized, and hence is their first year as presiding officers. For years past they have given a good account of their individual activities in fighting for a just depletion clause. Under their leadership, refutation was made of arguments of Treasury officials that the entire producing branch of the industry has profited excessively under the depletion allowance and that the earnings of the industry have been abnormally high as a result of the allowance. They have demonstrated to Congress that the industry pays more than its share of taxes and that, operating under this law, the industry furnished constantly improved products to a consuming public at prices which over a long period showed a substantial decline.

In a supplemental statement to the House ways and means committee, the cochairmen stated very effectively that the industry based its case upon the following clear and simple points:

"That it has long been the policy of Congress to encourage the exploration and development of petroleum reserves for the United States by providing in the tax law reasonable incentives for the exploration and assurances of protection against the unusual hazards of the business.

"That the wisdom of such a policy has been demonstrated by the extraordinary accomplishments in the finding of new reserves and of new recovery methods during the past 25 years.

"That the continuation in the tax law of the existing incentives and assurances is more important than ever, not only to encourage exploration and development, but to maintain the production of thousands of wells that might otherwise be abandoned.

"And, that the revenue to be gained by abandonment of the established policy is far too small to compensate for any threat to our petroleum supremacy, particularly during a period of national emergency."

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Renewal of Depletion Fight Is Promised by LaFollette

WASHINGTON, D. C.—Sen. Robert M. La Follette served notice in the Senate last week that a fight against the present oil-depletion allowance would be made when the next tax bill is under consideration.

This announcement was made as the Senate completed action on the pending revenue bill without making any change in present depletion allowances. Senator LaFollette had intended to move to amend the bill to repeal the percentage depletion allowances for oil and gas wells, although both House and Senate committees had refused to do so in spite of repeated requests from the Treasury Department. Before he could offer the amendment, however, the Senate adopted another amendment providing a 15 per cent depletion allowance for producers of rock asphalt and ball clay, and Senator LaFollette said that in view of that action he would not press for removal of the oil-depletion allowance but would make an effort to eliminate the allowance in the next revenue measure.

The Treasury is expected to propose another tax measure as soon as this one has become law, and hearings probably will be held during the winter.

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Allen A. Jergins Made Field Director of Facility Security

WASHINGTON, D. C.—Appointment of Allen A. Jergins, Los Angeles, Calif., as director at large for the Office of Petroleum Coordinator's Facility Security Division, was announced here last week. The duties of Mr. Jergins will be to serve as a field assistant to William D. Mason, director of facility security, in coordinating and directing measures for the security of the nation's oil facilities.

Appointment of four district directors of the Facility Security Division was announced at the same time. Frank A. Epps, of New York, will be in charge of facility security work in District 1; Edward J. Bullock, of Chicago, in District 2; George Sawtelle, of Houston, Tex., in District 3; and George F. Prussing, of Los Angeles, Calif., in District 5.

Mr. Jergins was vice president of the Jergins Oil Co. of Long Beach, Calif. A geologist and engineer, he has spent 16 years in the oil business. He was vice chairman of the California oil industry protection committee and a member of the western region committee of the Petroleum Industry War Council's committee on protection of petroleum facilities.

Mr. Epps was president of the Spartan Oil Co. of Dover, N. J. He has been a member of the fire protection committee of the American Petroleum Institute for 24 years. He is a director of the National Fire Protection Association and has been a member of its flammable liquids committee for 20 years.

Mr. Bullock was a vice president and director of the Standard Oil Co. of Indiana for 17 years, and was recently retired.

Mr. Sawtelle is president of the Kirby Petroleum Co., with which he has been associated for 21 years.

Mr. Prussing was with the Union Oil Co. in charge of safety and fire prevention for 22 years.

Plea for Delay in Gasoline Rationing Rejected by OPA

WASHINGTON, D. C.—Request of the Petroleum Industry War Council for a 90-day postponement of national-gasoline rationing was formally rejected October 12 by the Office of Price Administration. The council last week adopted a resolution requesting the delay in nation-wide rationing to permit a more comprehensive appraisal of the effect of voluntary curtailment of driving.

In refusing to honor the PIWC request, the OPA announced that the nation-wide rationing program would be instituted on November 22 as previously arranged.

Motorists outside the East Coast rationed area will register their vehicles and make their applications for gasoline rations November 9, it was announced by OPA October 12.

OPA also announced that all distributors of fuel oil from wholesalers down to retailers selling kerosene by the quart in 30 rationed states must register with local ration boards October 20 and 21 to be eligible for supplies.

Machinery Being Created to Operate Product-Pool Plan

WASHINGTON, D. C.—The Office of Petroleum Coordinator and affected industry committees are rapidly completing administrative machinery to put into effect OPC Directive 59 which requires pooling of tank-car deliveries into District 1.

The program has been put in charge of L. T. Kittinger, formerly vice president of Shell Oil Co., Inc., who is establishing offices in New York City. The plan was discussed by the Petroleum Industry War Council here last week and Mr. Kittinger met with several of the council committees and it was finally agreed to give him virtually blank check authority to order oil companies to do whatever is necessary under the directive. The general feeling was that it is the responsibility of the oil industry to keep the eastern states supplied with minimum essential amounts of petroleum products and that if the industry is not able to do this itself the Government probably would take over the job.

An office will be established for each of the six zones in District 1, with headquarters at Boston, Mass., New York, Philadelphia and Pittsburgh, Pa., Richmond, Va., and Atlanta, Ga. From 8 to 25 persons will be employed in each office. Mr. Kittinger's organization will have authority to order oil companies to ship particular products into certain zones, New England for example, whenever necessary to keep stocks up to minimum requirements.

The OPC has prepared uniform minimum specifications for the various grades of gasoline, kerosene and fuel oil which are to be sold in the East but has not yet seen fit to make them public. It is understood, however, that they call for only two grades of gasoline, regular, of 72 octane number, and premium, of 80 octane. The specifications are said to be very similar in all respects to most of the products now being sold in the East, and that neither marketers nor consumers will suffer severe hardships because of them.

Trainload terminal points are now being selected, and this work has already been completed in the New England zone where all rail shipments must move to 21 terminals.

Further announcements on the operation of Directive 59 are expected to be made by Mr. Kittinger shortly.

Meanwhile the Office of Defense Transportation issued supplemental orders to its General Order ODT 7 requiring tank cars to return to their last point of origin immediately upon unloading in the absence of other instructions, and requiring that to obtain permits for the operation of tank cars shippers must certify that they have complied with regulations to increase the flow of petroleum to the East.

The two ODT orders intended to speed oil to the East became effective October 10. One order (Exception Order ODT 7-3) extends to 200 miles the distance over which tank cars may not operate without general or special permit and shifts the burden of the long haul eastward to large tank cars. The other (Special Direction ODT 7-1) directs rail carriers to return tank cars to their last point of origin immediately after they are unloaded unless other provision has been made for their further movement.

The exception order requires permits for (1) the shipment of crude petroleum or petroleum products into 17 states of the East from points outside that area when in tank cars of less than 7,000 gal. shell capacity and (2) the movement of any commodity in tank cars of any capacity for distances of 200 miles or less, except the transportation of oil to the East in cars of a shell capacity of 7,000 gal. or more. Permits are not required for the transportation of petroleum into the states of Washington and Oregon.

ODT instructions to shippers point out that one purpose of the exception order is to "withdraw tank cars of less than 7,000 gal. shell capacity from the emergency petroleum movement" into the East and "replace them, car for car, with tank cars of greater capacity."

Another purpose, the instructions say, "is to replace tank cars of any capacity . . . with other modes of transportation." In accomplishing this diversion, however, truckers are not to abandon short hauls in order to accept shipments of more than 100 miles.

L. T. Kittinger, formerly vice president of Shell Oil Co., Inc., and more recently head of the Salvage Section, Materials Division, War Production Board, is to direct the product-pooling plan now being organized in OPC District 1

Accordingly, a company applying for a permit must certify that (1) it has replaced all smaller cars engaged in the long haul with an equal number of larger cars, except as authorized by the ODT, (2) caused no shipment of 100 miles or less to be diverted from tank truck to tank car, and (3) caused no trucks in its service to be diverted from hauls of less than 100 miles to hauls of more than 100 miles, except as the ODT directs.

ODT officials pointed out that permits for shipments of less than 200 miles might be withheld if the applicant had withdrawn small cars from the eastward petroleum movement without returning an equal number of larger cars.

Shippers must make application to the Tank Car Service Section of the ODT, using forms supplied by that section. The application must be filed by the person or company from whose plant the shipment is to be made.

Tank-Car Movement Reduced By Unforeseen Incidents

WASHINGTON, D. C.—The war emergency fleet of tank cars moved 768,924 bbl. of oil to the East Coast area during the week ended October 3.

This daily delivery of petroleum and petroleum products was approximately 8 per cent under the volume moved during the preceding week.

Commenting on the lower movement, Deputy Petroleum Coordinator Ralph K. Davies said:

"Several petroleum transportation and supply factors are responsible for the current reduction in East Coast oil deliveries by tank car.

"An important factor was the wreck on the Baltimore & Ohio Railroad which delayed the movement of several hundred tank cars scheduled for arrival and departure from a number of major eastern terminals."

DEATHS

GEORGE S. DAVISON, 86, former president of Gulf Oil Corp., Pittsburgh, Pa., died at a hospital October 3. Despite his advanced age, Mr. Davison maintained many of his business connections. He was president of the Gulf Oil from 1911 to 1929, and in the first World War was a member of the national petroleum war service committee.

ERNEST WILLIAM TEAGLE, 67, manager of the Chicago, Ill., district sales office of Sun Oil Co., and holder of one of the longest service records in the oil industry, died last week. He had been in the oil business for nearly 50 years. He joined Sun Oil in 1904, and had been with that firm continuously since that time. His widow survives.

CLARENCE MILFORD ZIEGLER, 74, retired employe of National Transit Pump & Machine Co., Oil City, Pa., died at an Oil City hospital last week. He had been ill for about a week. He had been identified with the oil business for 50 years. He retired from active service 9 years ago. His widow, a daughter and two sons survive.

BILLY C. JAMES, SR., 42, an employe of Standard Oil Co. of Louisiana for the past 18 years, died last week from a heart attack suffered while on a hunting trip in Arkansas. He resided 9 miles west of Homer, La. His widow, a son and a daughter survive.

THOMAS MARION WEBB, 64, an oil-field worker until his recent retirement, died last week in a Tulsa hospital. He had lived in Oklahoma since 1889, and in Tulsa since 1905. His widow and a son survive.

WILLIAM R. ZIEGLER, 65, oil-well employe from Hominy, Okla., died last week in Laredo, Tex., from a heart attack. He was a native of Virginia, but had lived in Oklahoma for many years.

W. W. McDONALD, 70, of McDonald & Campbell, oil producers and drilling contractors, Dallas, Tex., died October 10 in a Dallas hospital from a heart ailment. He had been ill nearly 2 years. Born in Pennsylvania, Mr. McDonald went to Ohio in 1886 with Ohio Oil Co., becoming production superintendent in Illinois divisions. In 1918 he went to Texas as general manager for Mid-Kansas Oil & Gas Co., a subsidiary of Ohio Oil. Besides his wife he is survived by three sons and two daughters.

ANTHONY F. BANNON, 71, oil operator and engineer, died Sunday in a Tulsa hospital, after a lengthy illness. A native of Corning, N. Y., Mr. Bannon moved to Bradford, where he served as city engineer. He came to Oklahoma in 1914. His widow and a daughter survive.

Natural Gas News

Cooperative Conservation Is Keynote at American Gas Association Annual Meeting

CHICAGO.—Willingness of the natural-gas industry to cooperate with the federal Government in establishing laws to conserve this vital natural resource for present and future use was strongly expressed at the twenty-fourth annual meeting of the American Gas Association in Chicago October 5-6.

An extended abstract of the paper by J. French Robinson, president of the East Ohio Gas Co. and retiring chairman of the natural-gas section of the A.G.A., appears on Page 25.

"The natural-gas industry," one official stated, "is showing continuing interest in recommendations of governmental agencies and regulatory authorities for a general natural-gas code similar to those already adopted for oil.

"Continuing objective of the natural-gas industry,' he pointed out, "is to do the work of most value to the war effort, and while doing so take care of all essential civilian needs."

The following reasons were advanced for the conservation of natural gas: (1) Primarily there is a general accord among industry men for conservation to assure present and future use; (2) conservation has inestimable value in pressure-maintenance operations as a medium for lifting oil to the surface; (3) additional uses of natural gas today are more numerous than ever before; and (4) the industry is cooperating fully with the Government to utilize fully the resources of natural gas in pursuing the war effort.

Although the natural-gas industry has not suffered the dislocations encountered by the petroleum industry it has been confronted with considerable difficulty in procurement of critical materials, it was indicated, and this situation may result in additional curtailment of deliveries to various industries, compared with the deliveries of previous winter periods.

Ernest R. Acker, president, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y., in another paper, "The Gas Industry in War," pointed out that the Office of Petroleum Coordinator has urged conservation of oil in water-gas production through the substitution of low-grade gasoline or liquefied petroleum gases for present enrichment oils or through reduction of the B.t.u. content of the gas.

He stated that pending settlement of the gasoline question, OPC has assured the association that crude oil would be available for manufactured gas company requirements during the coming winter, and companies have been advised to fill their storage tanks for the season's supply as soon as possible.

Projecting the vast potentialities of natural gas, E. Holley Poe, director, natural gas-natural gasoline division, OPC, in a paper, "Our Joint War Job," estimated that more than 50 per cent of the 1,900,000,000,000 cu. ft. of natural gas consumed by the 8,000,000 domestic, commercial and industrial customers in 34 states is used for industrial purposes which directly or indirectly affect the war program.

Mr. Poe pointed out that since 1938 the output of natural gas for industrial and commercial purposes has increased by more than 10 per cent per year. Indications are that this year will exceed last year by 25 per cent and in some areas as much as 40 per cent. These great increases are the result of the war production program, he said.

"As never before in its history," Mr. Poe continued, "the natural-gas business is one of supply and demand with a restricted deliverability resulting from limited supply of steel for augmentation of natural-gas pipe lines and development of natural-gas reserves.

He concluded by stating that conservation of natural-gas reserves and conservation in the production, transmission, and utilization of natural gas must be faced positively by all. Sound policies must be encouraged, he said, and sound laws and their proper enforcement must be sincerely advocated.

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SEC Approves Phillips' Offer On Panhandle Eastern Line

PHILADELPHIA, Pa.—Phillips Petroleum Co.'s offer to purchase $10,486,826 worth of Panhandle Eastern Pipe Line Co. stock from Columbia Oil & Gasoline Corp., has been approved by the Securities and Exchange Commission. This is another step in terminating litigation over control of the Panhandle company, which has been disputed between Columbia and Missouri-Kansas Pipe Line Co. for many months.

Phillips, according to the arrangement approved by SEC, will sell a half of its acquired interest to Missouri-Kansas whose control will then total approximately 68 per cent.

Panhandle Eastern Will Make Connection With Ohio Fuel

WASHINGTON, D. C.—A limited certificate of convenience and necessity has been issued to the Panhandle Eastern Pipe Line Co., Kansas City, Mo., for the construction of a 16-in. pipe line about 17 miles long extending from a point on the 22-in. main line of Panhandle's wholly owned subsidiary, Michigan Gas Transmission Corp., in Lucas County, Ohio, to the 16-in. line of the Ohio Fuel Gas Co., in the vicinity of Toledo, Ohio.

Construction of the new interconnection will relieve the threatened shortage of natural gas in the Appalachian area first reported in a survey made by the Federal Power Commission for the War Production Board early this year. Estimates of the amount of gas to be delivered through the new line range as high as 10 billion cubic feet per year.

The permit was issued after a hearing on the conflicting applications filed by Panhandle Eastern and Ohio Fuel Gas Co. The WPB has stated that the interconnection is essential to assure adequate supplies of gas to war industries in the region served by Ohio Fuel Gas.

In an opinion discussing the applications and the denial of a certificate to Ohio Fuel Gas for the interconnection, it is stated by the FPC that:

"Ohio Fuel proposes that the project should be considered only as a war emergency measure, that its cost should be amortized over a 5-year period, and that it should be authorized by a temporary certificate limited both in time and scope to the duration of the present war emergency.

"Panhandle Eastern, on the contrary, proposes that the connection should be permanent and that it should be authorized by a regular certificate unlimited in duration. It considers the connection as permanently necessary to serve both present war needs and future requirements occasioned by the rapidly depleting supply of natural gas in the Appalachian area."

Cabot Carbon Co. Seeking Carbon-Black Plant Permit

OKLAHOMA CITY, Okla.—Hearing was in progress here October 15 on application of Cabot Carbon Co. for a permit to construct and operate a carbon-black plant about 2½ miles east of Guymon, Okla., in the Hugoton gas field. The Cabot company proposes a plant with a capacity of 7,000,000 cu. ft. daily. The furnace-type plant projected by the company will yield, according to its permit-application prospectus, more than 5 lb. per 1,000 cu. ft. of gas.

The Cabot company has drilled and completed five wells to the regular Hugoton field gas pay and only three are currently connected to a regular commercial outlet. The three wells are supplying gas to Atlas Carbon Co. which operates a carbon-black plant near Guymon.

United Authorized to Build La Fourche Field Extension

WASHINGTON, D. C.—A certificate of public convenience and necessity was issued last week to the United Gas Pipe Line Co., Shreveport, La., authorizing the construction and operation of an extension to the company's existing interstate pipe lines to connect the gas supply in the La Fourche Crossing field in Louisiana with its pipe line which extends from the Gibson field to its Lirette-Mobile line.

The company's application, filed with the Federal Power Commission on August 4, proposed to meet the increased demands for natural gas, due mainly to the war effort, in the region served by its existing Lirette-Mobile line, through construction of the 5½-mile "La Fourche extension" to utilize available and adequate sources of supply of natural gas in southern Louisiana. The company estimated the total cost of the extension as $127,000.

Natural-Gas Consumption Maintains Rate of Increase

CHICAGO.—Natural-gas utility sales for July registered sharp increases over the same month of 1941, it was announced at the annual meeting of the American Gas Association here last week.

Total sales of natural gas during July 1942 amounted to 119,939,500,000 cu. ft., an increase of 8.9 per cent over last year. Sales for residential purposes increased 10.5 per cent, while commercial sales increased 20 per cent. Gas sold for industrial purposes, including amounts used in generating electric power in public utility steam plants throughout the country, were 7.5 per cent more than for July 1941.

ENGINEERING *and Operating* SECTION

Casing Corrosion in Oil Fields Producing Sour Gas

By T. D. BAILEY and ALEC M. CROWELL
Engineers, Arkansas Oil and Gas Commission

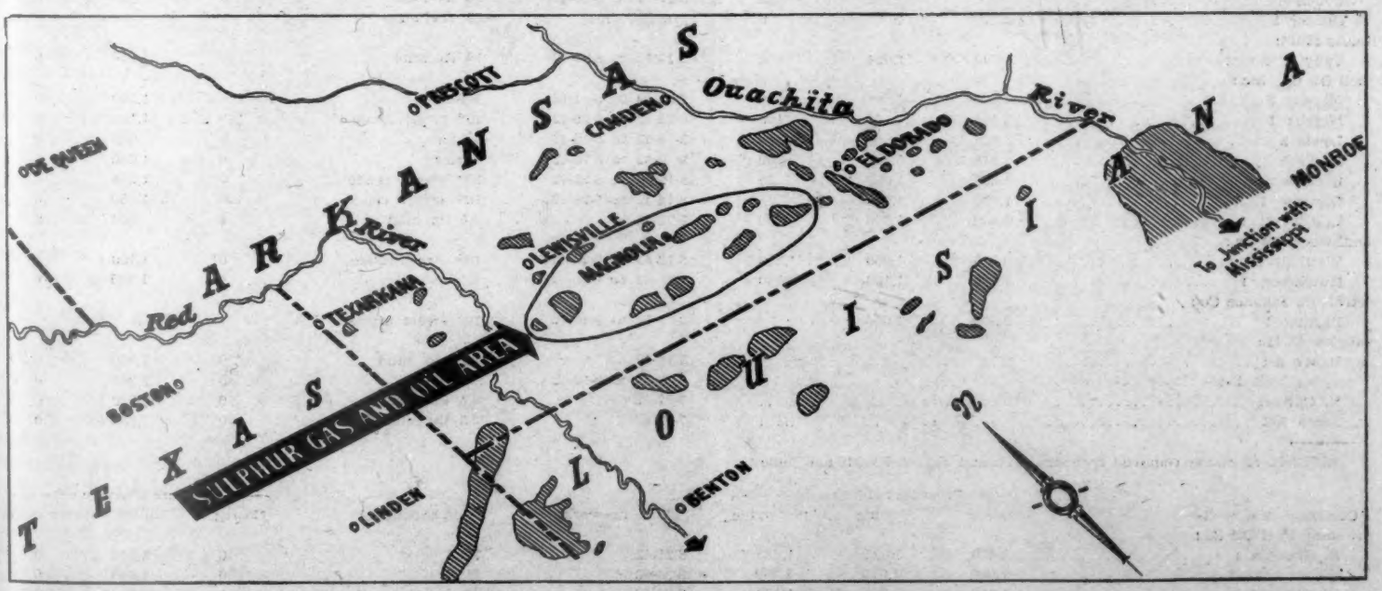
Corrosion in oil wells is generally associated with tubing and with the pump assemblies. Consequently the discovery of severe effects of corrosion in the casing strings at Magnolia, Arkansas, came as something of a surprise. Generally, no evidence of corrosion was found on the tubing strings.

A short biography of the authors of this article appears in Journalisms on Page 96.

OPERATORS in the 16 sour gas-producing oil fields of southern Arkansas have been requested by the State of Arkansas to take preventive measures to guard against corrosive action of hydrogen sulfide bearing gases found in these reservoirs. While damaged casing has been found only in the Magnolia field to a large extent and the Atlanta and McKamie fields to a minor extent, the imminence of corrosive action in the other fields has caused the state commission to include them in their workover requests.

Table 1 gives reservoir reserves and characteristics of 11 of the 16 sour gas fields of southern Arkansas. From this tabulation it will be noted that the hydrogen sulfide content of the gases found in these pools ranges from a high of 4,050 grains per 100 cu. ft. to a minimum of 30 grains per 100 cu. ft. The sour gas-producing oil pools of southern Arkansas are not oddities in that sour gas is found associated with oil in West Texas and New Mexico. In some instances the degree of sourness equals that of the pools discussed herein.

Due to the fact that the pools of southern Arkansas are operated under pressure conditions, i.e., produced in such a manner that the bottom-



Orientation drawing showing location of sour gas-producing oil fields of southern Arkansas. Arrow indicates a reserve of over 1 trillion cubic feet of sour natural gas associated with 300 million barrels of crude petroleum oil and distillate. Corrosion of oil-well casing is imminent in the 16 pools encompassed by circle in front of the arrow

hole pressure is maintained at the highest possible level, any damaged casing could prove most disastrous. The Oil and Gas Commission has requested all operators in the state, both as remedial and preventive measures, to observe the following procedure in all of the 16 sour gas-producing oil pools: (1) Kill each well with oil, mud, or oil-base mud; (2) set tubing packer immediately above the producing formation; (3) break out all tubing joints before going back into the hole and coat threads and fill collar recesses with thread lubricant; (4) leave oil, mud, or oil-base mud in both annuli, between the tubing and oil string and between the oil string and intemediate string; (5) install insulated couplings on flow lines.

As a matter of orientation, the sour gas and oil area of southern Arkansas and its relation to the Ark-La-Tex area are shown in a drawing accompanying this article.

A chronological discussion of the corrosion problem beginning with the Magnolia field follows:

The Magnolia field is located in Township 17s, Range 19 and 20w, Columbia County, Arkansas, and covers about 4,500 acres. There are 107 flowing and 8 pumping wells in the field, all spaced on a 40-acre pattern. These wells strike the pay horizon, the Smackover lime, at about 7,100 ft. subsea. The surface elevation is around 350 ft. The field is located over an anticlinal fold in which the thickness of oil-saturated zone varies up to 187 ft. A gas cap of considerable size exists above the gas-oil contact over most of the field. Average permeability and porosity are 1,500 md. and 18.5 per cent respectively, and connate water

TABLE 1—RESERVOIR, RESERVE AND CHARACTERISTICS OF 11 SOUR-GAS POOLS OF ARKANSAS

Pool: / County:	Atlanta Columbia	Big Creek Columbia	Buckner Columbia	Dorcheat Columbia	Magnolia Columbia	Macedonia Columbia	McKamie Lafayette	Mt. Holly Union	Schuler-Jones Union	Schuler-Reynolds Union	Village Columbia
Year of discovery	1938	1939	1937	1939	1938	1941	1940	1941	1937*	1937	1938
Producing formation	lime	lime	lime	lime	lime	lime	lime	lime	sand	lime	lime
Water level (ft.)	8,000	7,730	7,010	8,660	7,300	8,660	?	6,943	7,280	7,420	7,123
Effective section (ft.)	30	33	30	40	125	75	100	20	38	20	20
Porosity, per cent	15	13	20	13	19	14	17	20	18	20	20
Permeability, millidarcys	1,276	250	50	155	1,500	230	500	1,130	355	1,500	2,000
Producing wells	22	1	28	22	115	15	16	5	unit	15	12
Well spacing, acres	40	160	40	80	40	80	160	40	unit	40	40
Original pressure (b.hp.)	3,821	3,723	3,195	4,243	3,465	4,130	4,365	3,180	3,520	3,550	3,350
Current pressure (b.hp.)	3,480	3,723	2,561	3,300	3,050	3,800	4,300	3,100	1,500	3,300	3,200
Gas-oil ratio, cu. ft. per bbl.	1,604	24,000	250	10,000	900	13,000	8,000	7,500	126	867	3,000
B.t.u. value of gas	1,100	790	1,000	1,081	1,082	1,074	1,006	1,114	1,000	987	900
Natural gasoline, g.p.m.	1.0	0.5	3.0	0.5	1.3	0.5	0.7	0.7	0.7	1.5	0.5
Carbon dioxide, per cent volume	4.9	3.0	5.1	2.0	6.2	2.5	4.3	?	?	?	?
Gravity of gas	0.78	0.78	1.06	0.72	0.95	0.74	0.82	0.77	0.76	0.80	0.88
Gravity oil or condensate	45	60	32	56	38	60	58	43	34	38	41
Million barrels oil reserve	5	3	8	18	157	12	36	5	32	3	3
Billion cu. ft. gas reserve	9	66	1	140	197	181	423	9	45	5	9
Grains H_2S per 100 cu. ft.	1,800	335	167	2,400	1,400	1,900	4,050	374	30	865	374
Nitrogen, per vent volume	2.9	36.6	1.1	5.7	1.3	6.1	12.0	?	?	?	?

*Pool is being repressured. All other pools are water drive.

TABLE 2—DATA ON REWORKED WELLS IN MAGNOLIA, ARK.

Company and well—	Pressure before rework: Casing	Tubing	Water string	Time of rework	Fluid in annulus	Pressure after rework: Casing	Tubing	Water string
Atlantic Refining Co.:								
Garrett D-1	1,050	1,400	0	8- 7-39 to 8-19-39	9.5 lb. mud	1,000	1,550	0
Foster 1	2,500	1,350	0	4- 5-40 to 4-19-40	9.5 lb. mud	700	700	0
Brown 1	1,000	850	1,000	present time	....	....	....	....
Garrett C-1*	1,500	1,000	1,500	8- 4-42 to 8-19-42	9.2° sweet fuel oil	0	1,000	0
Carter Oil Co.:								
Booth Unit B-1	1,500	1,075	1,500	8-23-42 to 8-31-42	9.6 lb. mud	0	1,090	100
Frankel, Frank et al:								
C. E. Crumpler B-1	....	....	....	1- 1-41	9.8 lb. mud	0	1,000	0
Placid Oil Co.:								
Couch 2	2,340	980	1,100	8-26-42 to 8-30-42	10 lb. mud	0	1,100	0
Couch 1	....	980	410	8-21-42 to 8-26-42	10 lb. mud	0	980	0
Garner 1	2,340	1,060	0	present time	18° fuel oil	....	....	..
Hassie Hunt:								
Tally 1	700	1,024	120	8-13-42 to 8-20-42	10 lb. mud	0	1,024	0
Shell Oil Co., Inc.:								
Merritt 2	1,300	1,075	1,300	7-22-42 to 8- 1-42	Water	200	1,100	0
Merritt 1	2,400	1,100	180	8-24-42 to 8-29-42	19° sweet crude	140	1,100	0
Lewis 2	2,425	925	1,480	8- 2-42 to 8- 6-42	Water	0	925	0
Lewis 1	2,375	1,000	900	8- 9-42 to 8-13-42	Water	0	1,050	0
Glascow 2	1,625	1,000	25	8-19-42 to 8-22-42	19° sweet crude	0	1,085	0
Glascow 1	1,650	1,000	225	8-14-42 to 8-18-42	19° sweet crude	400	1,100	0
L. Garrett 1	2,400	1,100	1,200	7-22-42	9.5 lb. mud	0	950	0
Southwood Oil Co.:								
Walthall 2	800	1,050	1,250	8-12-42 to 8-25-42	19° sweet crude	0	1,100	0
Hutcheson 1	1,650	1,100	1,250	8-27-42 to 9- 3-42	19° sweet crude	0	1,100	0
Petroleum Finance Co.:								
Barnett 1	2,300	1,050	0	9- 3-42 to 9-10-42	19° sweet crude	....	....	
Vaughn, G. H.:								
Baker A-1	....	....	....	5-11-42	10.2 lb. mud	0	1,050	0
Jones Unit B-1	....	....	....	6- 6-42 to 6-16-42	9.2 lb. mud	0	1,025	0
N. Garrett	....	....	....	7- 7-42	9.5 lb. mud	0	1,090	0
Jones A-2	....	....	....	7-18-42	9.5 lb. mud	0	1,080	0

*2,923 ft. of casing removed from the well and replaced with new pipe.

Company and well—	Pressure before rework: Casing	Tubing	Water string	Time of rework	Fluid in packer	Pressure after rework: Casing	Tubing	Water string
Arkansas Fuel Oil Co.:								
D. Glasgow 1	1,610	1,025	1,625	8-21-42	Mud	0	1,040	0
Glasgow-Crisp	1,300	1,010	1,300	8-24-42	Mud	0	1,040	0
W. King A-1	1,490	375	1,490	8-29-42	Mud	0	850	0

occupying about 20 per cent of the pore space. The original reserve of the field has been estimated at 180,000,000 bbl. of oil. Sulfur content of the crude is 0.89 per cent, and about 1,500 grains of hydrogen sulfide per 100 cu. ft. of gas is found in the gas contained in the gas cap. A bottom-hole pressure of 3,150 lb. per sq. in. exists in the field and a very active water drive is present in the porous lime. The field is 4 years old and 10 per cent of the recoverable oil has been removed.

Typical Well

A typical well in the field might be given by describing Shell Oil Co., Inc., 1 Foster. This well was drilled to 126 ft. with a 15-in. bit and 13⅜-in. casing was set with 250 sacks of cement. A 10¾-in. hole was drilled to 2,199 ft. and 36 lb., 9⅝-in. casing was cemented to this depth with 1,000 sacks of cement. A 6¾-in. hole was drilled through the producing formation and 7,614 ft. of 5½-in. casing (top half 17-lb. and bottom half 14-lb.) was cemented with 1,500 sacks of cement. The well was completed by perforating the casing with 208 holes. A regular 5,000-lb. test christmas tree was used. Upset tubing with a blank perforated joint that has a bull plug built onto the bottom end was used as the flow string. The well has a gas-oil ratio of about 950 cu. ft. per barrel. Other wells are completed in a similar manner except that a few use less cement on the outside of the oil string; some of the operators use 7-in. casing for the oil string, 10¾-in. for water string, and 16-in. for surface casing; and about half of the wells have the water string set at a depth of about 3,500 ft. instead of 2,200 ft.

Evidence of casing corrosion in the Magnolia field was first discovered on May 1, 1942. On this date oil was found to be flowing from the annular space between the 6 and 9⅝-in. casing strings on G. H. Vaughn 1 Baker. The oil was evidently coming through an opening in the 6-in. string. A derrick was immediately erected and the well was reworked between May 7 and May 11. The well was killed with oil-base mud and the tubing withdrawn. No evidence of corrosion could be found on the tubing and no leak was located in the oil string. A Lane-Wells hook-wall packer was set at 7,520 ft. and the annulus between the tubing and the oil string was filled with 10.2-lb mud. Since reworking no further trouble has occurred on this well.

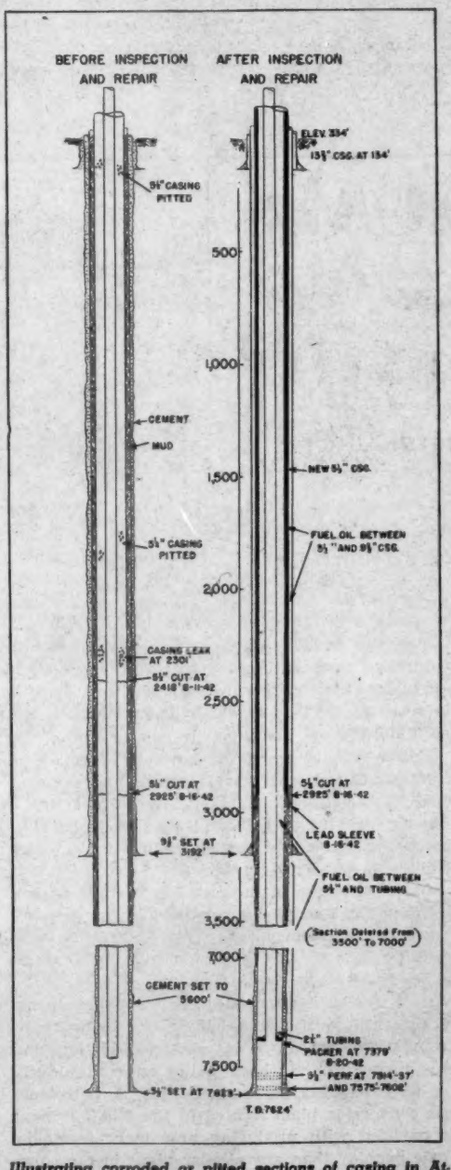
The trouble encountered in G. H. Vaughn 1 Baker caused the Arkansas Oil and Gas Commission to make a complete survey of pressures on the tubing, oil string, and water string on all of the wells in the field. Pressure was found to exist in the water string on about one-third of the wells. In most cases this pressure could be bled off in a few minutes, indicating very small leaks in the oil string, but on some wells this pressure would bleed off very slowly or not at all, indicating that an opening of considerable size existed in the oil string.

Visual Inspection of Oil String

Presence of so many leaky oil strings caused men in the petroleum industry to offer many theories as to the cause of the trouble. Finally, the Atlantic Refining Co. decided to remove the casing from C-1 Levi Garrett after mud had been circulated down the oil string and up the water string with 1,000-lb. pump pressure. The oil string was first cut at 2,418 ft. and removed from the well. The hole was found at a depth of 2,301 ft. The joint of pipe containing the hole was cut open lengthwise in order to more effectively examine the hole. On the inside, the hole was about ⅛ by ¾ in. in size and of an eliptical shape with the long axis parallel to the casing string. The hole tapered inward toward the outside of the casing and was about ⅛ by ¼ in. in diameter on the outside of the casing string. The inside of the remainder of the joint was corroded with various-sized pits of similar shape. These pits also seemed to lie in rows parallel to the vertical axis of the casing. About 500 ft. more of casing was cut and removed from the well to determine if corrosion existed farther down the hole. The whole section of 88 joints was analyzed with a Tuboscope and 20 joints were rejected. The casing seemed to be in good condition on the latter 300 ft. analyzed. The removed part of the oil string was replaced with new pipe and connected to the casing in the hole by means of a Baash-Ross overshot. A packer was set at 7,360 ft. and sweet fuel oil was used to fill the annular space between the tubing and the oil string.

Theories on Causes

After viewing the pits in the casing removed by the Atlantic Refining Co., experts are still of divided opinion as to the cause of the corrosion. The two most prominent theories offered are: (1) electrolysis and (2) electrochemical or galvanic action resulting from the presence of hydrogen sulfide. The latter theory seems to have the most support.



Illustrating corroded or pitted sections of casing in Atlantic Refining Co. 1-C Levi Garrett, Magnolia field (after a preliminary drawing of U. S. Bureau of Mines dated August 8, 1942)

Galvanic Action

Electrochemical or galvanic action resulting from the presence of hydrogen sulfide in the gas seems to be the most prevalent theory because of the high concentration of hydrogen sulfide present in the Magnolia field. Hydrogen sulfide readily reacts with oxygen and forms sulfuric acid. Prof. W. F. Cloud in his book, "Petroleum Production," says "before corrosion as a result of electrochemical or galvanic action can occur, certain conditions must exist: water, moisture, or water vapor must be present; chemicals that will react to form an electrolyte must exist; and some substance that is electronegative to the casing string must be in the electrolyte. This latter essential may exist in the form of iron sulfide scale, localized heterogeneity in the composition of the steel, mill scale (iron oxide), and dented or scratched iron surface." Professor Cloud also describes the presence of vertical rows of oval-shaped pits that result from hydrogen sulfide corrosion on tubing strings in the Smackover field in Arkansas.

The electrolyte could be formed from the H_2S, O_2, and water vapor present in the well. Water vapor could condense on the inside wall of the casing. The droplets of condensed water could run down the trough formed by the casing, thus accounting for the pits lying in vertical rows. H_2S and O_2 in the gas could unite to form H_2SO_4. The sulfuric acid so formed would mix with the water to form a weak electrolyte. Pieces of mill scale or iron sulfide scale could lodge between the tubing and the casing. Galvanic action would result where the mill scale or iron sulfide scale and electrolyte came in contact with the casing. Such action should also affect the tubing, but the tubing seems to be in good condition. The heat coming from the flowing column of oil in the tubing might prevent moisture from condensing on the tubing walls and thereby prevent corrosion of the tubing.

Remedial Measures

Since there are good arguments for both of the theories given, precautions are being taken against both possibilities. The electrolysis possibility is being easily remedied by placing insulated connections on the flow line at the point of connection to the well or separator. Possibility of electrochemical or galvanic action due to the presence of hydrogen sulfide is being guarded against by setting corrosion resistant packers above the producing formation between the tubing and oil string and by filling the annular space between these two strings with either oil-base mud or sweet oil. The annular space between the water string and surface string is also being kept filled with mud or oil. As an added measure of safety, a commercial inhibitor might be added to the mud or oil behind the packer to further reduce corrosion.

The question has arisen as to the feasibility of using cast iron or steel packers. It is known from

the study of sucker-rod life in sour-gas areas, that wrought iron, alloyed, and normalized low-carbon rods, although lacking the tensile strength of steel rods, will far outlast rods made of steel. It would seem more practical, therefore, to use a packer made of cast iron, not only from the corrosion standpoint, but also from the comparative ease of drilling of cast iron as compared with steel. The makers of "Duprene" and "Neoprene" packer rings believe that the rings will resist corrosion successfully, since stoppers used in bottles containing concentrated sulfuric acid remain relatively unaffected.

Reworked Wells

Table 2 gives the names of the wells reworked to date; the pressures on the tubing, oil and water strings, before and after reworking; date of reworking; type of packer set; and fluid used in the annular space between tubing and oil string. So far, 27 wells have been reworked, and all of the operators plan to rework the rest of their wells in the near future. About half of the wells are completed with sweet oil, about half with mud, and a few are completed with clear water in the annular space. Sweet fuel oil seems to offer the best results. Mud is also good, but there is a possibility that some chemical reaction might cause flocculation and settling out of the weighting material. This latter effect might cause the tubing to get stuck in the hole and cause an expensive washover job when the tubing is withdrawn at some future date. Several types of packers are being used with each operator supporting his choice. Pressures on the oil string after reworking are due to heat expansion of the fluid in the annular space.

Packers Hold

It will be noted in Table 2 that the first two wells listed under the Atlantic Refining Co. have had packers set for 3 and 2½ years, respectively. These wells have the annular space above the packer filled with mud. The fact that no pressure has appeared on the water string offers encouragement to setting packers.

Economics

Wide spacing and sound conservation practices have made the ultimate return to the operators of wells in southern Arkansas extremely attractive. The small investment required to set packers and insulate flow lines is cheap protection against the corrosion hazards that exist in the area. The state has found no occasion to issue a formal order requiring the remedial work as the operators have proceeded diligently on their own accord.

Saving Critical Materials By Reusing Still Tubes

A series of instructions has been issued by H. M. Nichols, manager of Atlantic Refining Co. regarding the use and care of certain critical war materials in use in the company's plants. Since all refiners are interested in accomplishing the same end, these items will be published serially in coming issues. Mr. Nichols explains:

"The following is sent to each department superintendent with enough copies for each foreman and bulletin board. The items are discussed at a meeting of the foremen and superintendent, after which the men are individually instructed. Since the foreman must sign an order to get the proper clothing and since the tool room checks this order when the goods are returned a definite control exists.

"Through inspections, causes for trouble are eliminated, and these incidents are brought to the attention of the men. The results in saving this vital material, rubber, have justified the time spent."

STILL tubes which have been used until they have an unsafe wall thickness can often be used elsewhere. They can be used in place of pipe, where lower pressures and temperatures are in use. In preheaters where a low pressure and temperature is maintained these tubes will last for a long period. Pipe supports, acid lines, drainage lines, stop posts and ferrules are other uses to which these used tubes have been placed.

Pipe, torn out of part of the plant, is inspected and reconditioned for use in place of new pipe.

Fittings are removed from scrap pipe and reconditioned for use in place of new fittings. Welded fittings are burned off so that in remachining the original lengths will be held.

Screw flanges are removed from scrap pipe and bored so that they can be used as slip-on flanges.

Old stainless steel orifice plates are used in new installations requiring larger inside diameters.

Using monel for orifice plates and control valve trim for cracked unsweetened distillate service has saved frequent replacements formerly made of stainless steel.

Using durimet for orifice plates and control valves for sulfuric acid service has also saved a considerable quantity of stainless steel.

Through years of investigation and tests on pump packings, the number of kinds carried in stock have been reduced, the wear on the moving parts has been reduced, and packings containing critical materials are used only where the requirements justify such an installation.

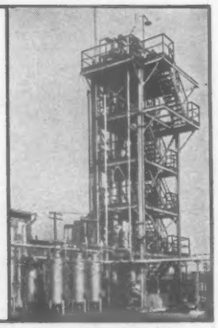
Through the use of an overlay of chrome nickel welding rod, on the surfaces attacked by corrosive materials, to fittings, carbon moly can be used in place of chrome moly castings and forgings. Due to the size and weight of these fittings a large tonnage of critical materials is saved each year.

It has been found possible to recondition hightен studs by remachining to smaller standard sizes. Formerly these were sold as scrap. Now, the larger sizes only will have to be purchased as new, except in such places where the number reconditioned will not maintain the supply. This is a definite saving of material difficult to replace.

Chrome pump shafts are plated as often as possible to bring the sizes up to the original. Where this not possible, the shafts are turned to the largest diameter and used as new material for making smaller pump shafts and valve stems.

CHEMICALS *from* PETROLEUM

By W. T. ZIEGENHAIN

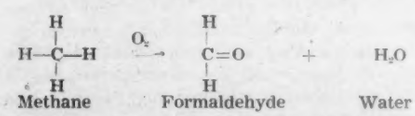


FORMALDEHYDE

THE manufacture of formaldehyde from petroleum is an excellent example of controlled oxidation among aliphatic hydrocarbons. Stated more specifically, the commercial procedure involves the oxidation of natural gas to produce a mixture of formaldehyde and methanol, including small quantities of acetaldehyde and acetone. Because natural gas contains, principally, a mixture of hydrocarbons ranging from the C_1 through the C_4 groups, it is only natural that a mixture of products be made as a result of oxidizing the mass.

In commercial operations, the mixture of these hydrocarbons is first compressed and it enters a converter along with a stream of compressed air. Obviously, both are carefully metered in advance of this step. Inside the converter, the body is a combination of petroleum liquids and gases and air. The temperature and pressure maintained in this zone are above normal but are moderate.

Theoretically, the conversion of methane gas to formaldehyde by oxidation is pictured as follows:



Methane — Formaldehyde — Water

In the converter the products and unconverted charge are passed through a cooler where partial liquefaction takes place and separation of the liquid and gases follows. This step rids the mixture of the unconverted gaseous hydrocarbons but the problem remains of separating the formaldehyde, methanol, and acetaldehyde. This is especially difficult because the formaldehyde is essentially a gas dissolved in water.

The use of fractionation, under very closely controlled temperature and pressure limitations, effects the essential separation and the three commercial products formaldehyde, methanol, and acetaldehyde are continuously run to storage.

Formaldehyde in its commercial form is a colorless liquid with a suffocating and pungent odor. It is poisonous if taken internally. It has a specific gravity of 1.075 to 1.081. The formaldehyde gas itself can be condensed to a liquid which boils at —5.6° F. (—21° C.)

Its primary use in the past has been as an embalming fluid, as an intermediate in the preparation of other chemicals, as a stabilizer in foods, a disinfectant, and as a preservative of canned fruits and syrups.

It is interesting to note that already, substantial quantities of formaldehyde are being made from petroleum gases by direct oxidation and this procedure has been going on continuously on an expanding basis since 1928. A petroleum gas conversion plant located in the Mid-Continent is credited with producing now more formaldehyde per day than any similar plant in the country. Obviously, the production of methanol and the other byproducts have also increased and the total output of the plant is now impressive.

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Operating Ideas

Steel Frame Support For Oil Drums

An unusually handy and serviceable steel frame unit for oil drums has been devised for use with a mechanical rig now operating in Oklahoma. The frame holds three drums supported in individual cradles which can be turned to any position by a crank. The crank operates through a gear arrangement utilizing a worm gear from an automobile steering post. One revolution of the crank places the drums in a horizontal position.

Chain Clamps For Foundation Timbers

A short piece of drilling chain, used in conjunction with a hook bolt having an extra long thread, forms an effective clamp for fastening two or more heavy timbers used as mat or foundation under a derrick-superstructure corner. The chain is placed around the timbers with an end horizontal across the tops and the bolt hooked into the end link. The threaded end is passed through the aperture in the link at the edge of the timbers in such a manner that, when the bolts are tightened, the chain will be drawn tightly around the assembly. A large washer or flange from a pipe connection of the proper size to fit snugly over the bolt affords wide surface for engaging the chain link and makes it easy to tighten the nuts on the bolt.

Roller Aids Laying Down Pipe

To lessen the drag of a joint of drill pipe over the edge of the derrick floor when laying down pipe, a Texas drilling contractor has provided a metal roller on the derrick floor at the top of the skidway. The roller consists of a short section of pipe supported on another section of pipe of slightly smaller diameter over which it fits sleevelike. The supporting pipe is longer than the roller pipe and protrudes at both ends for mounting as an axle. Ends of the supporting pipe are secured on wooden blocks of sufficient height to allow clearance of the roller pipe above the floor. The roller lightens the load on the man operating the dolly on the lower end of drill pipe, enabling him to back away as he drags out the joint.

Cat-Hook For Picking Up Pipe

A catline hook for picking up pipe in making a connection on a rotary rig has been devised and is in use by a drilling contractor in the East Edmond, Oklahoma, area. It contains only two parts, a hook and a locking piece which moves on a pin. Safe to operate, it can be engaged or disengaged in a moment simply by slackening off on the catline. It slips over the pipe readily, and maintains a secure hold.

The *NITRATION* of Aliphatic Hydrocarbons (Part 1)

By GUSTAV EGLOFF, M. ALEXANDER, and P. M. VAN ARSDELL

Universal Oil Products Co. Research Laboratories, Chicago, Ill.

EDITOR'S NOTE: Here the Halogenation, Oxidation, and Nitration of Aliphatic Hydrocarbons series deals with the dangerous but highly commercial addition of nitrogen, the NO_2 or the NH_2 radical to a paraffin base. The laboratory procedure for accomplishing these reactions have been known for nearly 100 years but the commercial application of nitrating methane, ethane, and propane was not satisfactorily developed until 1940.

The earlier seven parts of this series started August 20. The contents of this one follows:

1. *Introduction*
2. *Nitration of Alkanes*
   (a) *Vapor phase with nitric acid*
   (b) *Vapor phase with nitrogen tetroxide*
   (c) *Liquid phase and nitric-sulfuric acid mixtures*
   (d) *Catalytic*
3. *Nitration of Alkenes*
   (a) *Nitric acid*
   (b) *Nitrogen oxides*
   (c) *Catalytic*
   (d) *Electrochemical*
4. *Nitration of Alkynes.*

Introduction

A NEW chemical industry has come into being based upon nitrating methane, ethane, propane, and butanes derived from natural gas or petroleum. Nitroparaffins are of scientific and industrial importance not alone as such, but also as intermediaries in forming a whole host of other products. Despite the fact that Victor Meyer[1] obtained nitroparaffins from alkyl iodide and silver nitrite, and Beilstein and Kurbatov[2] produced them from petroleum fractions about 70 years ago, developments had not extended beyond the laboratory stage until recently. The commercial possibilities have been realized as a result of the vast study directed by Dr. H. B. Hass of Purdue University during the last decade.[3]

In the summer of 1940, production of nitromethane, nitroethane, and 1- and 2-nitropropane was on a commercial scale in the United States.[4] The explosive character of certain derivatives and the production of such derivatives as lachrymators makes this industry of special significance today during the gigantic global war. Mononitroparaffins as solvents have properties which are desirable for a number of processes. These properties include a medium boiling point, mild odor, higher flash point than equal solvents, and solvent action for a wide variety of substances.[5] As an intermediate, it is used in the synthesis of a variety of organic compounds.

The specific properties of the nitroparaffins are summarized in Table 1.[5]

A commercial process for producing nitroparaffins (Chem & Met. Eng., Sept. 1942, p. 129) "... consists of three steps or stages: (1) The high-temperature nitration of propane in vapor phase; (2) separation of reaction products and recovery of unreacted materials for recycling and (3) fractional distillation and purification of the nitroparaffins. The nitric acid is heated to about 400° C. and the vapors are mixed with propane under pressure of about 150 lb. per sq. in. The highly exothermic reaction takes place instantly and unless the products of the reaction are rapidly cooled, there is a progressive oxidation of the hydrocarbons to CO and CO_2. In addition to the nitroparaffins the condensate contains water introduced with the nitric acid and that formed by the reaction. Nitroparaffins still remaining in the gas are removed by countercurrent scrubbing operations, after which the crude NP's are recovered from the scrub liquor and condensate by steam distillation. The crude nitroparaffins are decanted from the condensed steam and separated into the individual components by continuous vacuum distillation and fractionation. There are six fractions—the four commercial NP's—nitromethane, nitroethane, 1-nitropropane, and 2-nitropropane—and the low and high boiling fractions. Nitration gases from the condenser and nitro paraffin absorber contain unreacted propane and oxides of nitrogen which are recovered and recycled."

Used as Solvents

Nitroparaffins are useful as solvents in the coating industry. In cellulose acetate lacquers they assure a good flow and rapid hardening properties and freedom from blushing.[6] These are of even greater value in the formation of cellulose acetobutyrate lacquers.[7] The preparation of cellulose triacetates is also simplified by a nitroparaffin solvent. For both vinyl acetate and vinyl chloride co-polymers, the nitroparaffins are good solvents.[5] As a remover of finishes resistant to ordinary paint and varnish removers, the nitroparaffins are more effective than ordinary removers. Oil and spirit solvent dyes dissolve readily in nitroparaffins. Thus "dip-dyeing" of molded plastics is made possible.

Primary amines are formed by the reduction of nitroparaffins.[5] The amines are in turn used as raw material in the synthesis of pharmaceuticals, dyestuffs, rubber chemicals, emulsifying agents and other products. *n*-Alkylhydroxylamines result from mild reduction of the nitroparaffins. Aromatic and aliphatic nitrohydroxy compounds may be obtained by condensation with aldehydes. Of the nitrohydroxy compounds, 2-nitro-2-methyl-1-propanol is particularly useful in the heat sensitizing of rubber latex. Other uses of nitrohydroxy compounds are found in the synthesis of nitrohydroxy esters, nitro olefins, aminodioxanes, xanthates, and tris(hydroxymethyl)nitromethane trinitrate, a high explosive which is more stable and of lower melting point than nitroglycerin. The aminohydroxy compounds are used as emulsion paste, automobile cleaner polish, naphtha emulsion shoe cleaners, cosmetic creams, hand lotions, mineral oil emulsions and oleate and stearate soaps. As intermediates, they are also used in the synthesis of substituted oxazolines, oxazolidines, ammonium chloride salts, amides which are good surface agents and detergents, and substituted mercapto thiazolines which are good vulcanization accelerators for rubber. Other compounds synthesized from nitroparaffins are dinitroneopentane, the corresponding amine, alkyl nitronic acids, methazonic acid, nitroacetic acid, aminoacetic acid, the chloronitro compounds, β-dioximes, and isoxazoles. An effective larvicide and lachrymator, chloropicrin, is produced by a process involving the use of hypochlorous acid and calcium carbonate on nitroparaffins.[8] Nitroparaffins and chloronitroparaffins are also useful as inhibitors in the control of gelling in vulcanizing cements.[9] Hydroxylamines are intermediates in the synthesis of many chemicals used in dyestuffs, pharmaceuticals, resins, and flotation agents.[5]

Due to the explosive nature of some derivatives

[1]Meyer, Ber. 5, 203, 399 (1872).
[2]Beilstein and Kurbatov, Ber. 13, 1818 (1880); Ber. 14, 1620 (1881).
[3]Haas, Proc. Indiana Acad. Sci. 48, 104 (1939).
[4]Bogin and Wampner, Ind Eng. Chem. 34, 1091 (1942).
[5]The Nitroparaffins, Commercial Solvents Corp.
[6]Bogin, Paint, Oil & Chem. Rev., Aug. 27, 1942, pp 9, 34.
[7]Bogin, Paint, Oil & Chem. Rev., Sept. 10, 1942, p. 9.
[5]Gabriel, Ind. Eng. Chem. 32, 887 (1940).
[8]Campbell, Ind Eng. Chem. 33, 809 (1941).

TABLE 1—PROPERTIES OF NITROPARAFFINS

	Nitro-methane	Nitro-ethane	1-Nitro-propane	2-Nitro-propane
Formula	CH_3NO_2	$CH_3CH_2NO_2$	$CH_3CH_2CH_2NO_2$	$CH_3CHNO_2CH_3$
Molecular weight	61.04	75.07	89.09	89.09
Specific gravity at $\frac{20°}{20°}$ C.	1.139	1.052	1.003	0.992
Pounds per U. S. gallon at 20° C.	9.48	8.75	8.35	8.24
Melting point, °C.	—29	—90	—108	—93
Boiling point, °C.	101.2	114.0	131.6	120.3
Flash point, °F. (Tag open cup)	112	106	120	103
Vapor pressure, mm. at 20° C.	27.8	15.6	7.5	12.9
Surface tension, dynes per cm. at 20° C.	37.0	31.3	30.0	30.0
Refractive index at 20° C.	1.3818	1.3916	1.4015	1.3941
pH 0.01M aqueous solution at 25° C.	6.4	6.0	6.0	6.2
Rate of evaporation, by weight (*n*-butyl acetate=100)	180	145	100	124
Solubility at 20° C.:				
Ml. solvent in 100 ml. water	9.5	4.5	1.4	1.7
Ml. water in 100 ml. solvent	2.2	0.9	0.5	0.6

of nitromethane and nitroethane, extensive studies of these compounds have been conducted.[10] Tetranitromethane combines with hydrocarbons to form an explosive mixture which is the most destructive, shattering substance known.[11] In carrying out experimental work in nitrating hydrocarbons, great care must be taken to avoid explosions. As an illustration of what can result from carelessness or ignorance in handling the above mixture, the following citation is given:

"On May 27, 1920, 10 students were killed and 20 severely wounded by an explosion of 10 g. of a tetranitromethane-toluene mixture. Tretranitromethane forms with hydrocarbons, such as benzene and toluene, the most brisant, destructive explosive mixture possible to prepare today. It gives the highest pressure and temperature rises and sinister reaction of all chemistry. Tetranitromethane is very poisonous, affecting the membranes of the eyes and nose. It is always formed as a troublesome byproduct in nitration of aromatic hydrocarbons and always accompanies crude trinitrotoluene."

The alkanes are the most difficult aliphatics to nitrate, and, of these, the lower members presented the greatest problem, which has been solved by the use of vapor-phase nitration. In general the order of nitration is: primary < secondary < tertiary, although high temperatures increase the yield of primary at the expense of the secondary and tertiary. Superatmospheric pressure increases the rate of reaction. Mono- and dinitro compounds are the principal products of alkanes, and the mononitros are best produced in vapor phase with nitric acid. Either the nitric acid or nitrosulfuric acid liquid-phase reactions or the nitrogen teroxide vapor-phase reaction pròduces a mixture of mono- and dinitro products. In the liquid phase the formation of the mononitro compounds is promoted by the use of a dilute acid.

Nitroso, nitro, nitrite, and nitrate groups add to alkenes in various combinations. The course of the reaction with nitrogen oxides seems to be affected by the relative polarities of the unsaturated carbon atoms. Substitution products have been found, but they may be formed by addition followed by the splitting out of a simple molecule. The mechanism of the reaction with alkenes is addition to the double bond of the two component parts of the reagent, either with or without subsequent oxidation.

Complex alicyclic products containing nitrogen in the ring are formed from alkynes. Mechanisms involving initial hydration are advanced for the formation of some of the products.

2. Nitration of Alkanes

A. Vapor phase with nitric acid.

In vapor-phase nitration of alkanes such as methane, ethane, propane and butanes by nitric acid, a homogeneous gas phase reaction is evidenced by the occurrence of the same type reaction from hot and cold walls.[12] The nitration is presumably of second order.[13] Oxidation is the chief reaction competing with nitration.

Vapor-phase nitration has been utilized, especially for the lower alkanes, as those having fewer than five carbon atoms have critical temperatures below the temperatures at which sufficiently rapid nitration occurs.[12] The liquid-phase reaction is impractical because all organic solvents which could be used are oxidized considerably by the nitric acid under the experimental conditions necessary for these lower members. Mononitro compounds can be produced by vapor-phase nitration practically to the exclusion of dinitro and more highly nitrated compounds due to the short contact time. In liquid-phase reactions polynitro compounds are formed in addition to mononitro compounds since, in general, the nitrated products are more soluble than the hydrocarbon in the acid layer and consequently are subjected to further nitration. At the temperature used, about 400°, nitric acid decomposes into nitric oxide, nitrogen dioxide, water, and oxygen. The higher temperature so accelerates the nitration reaction, however, that it takes place before much decomposition has occurred. Increased yields resulted with increased hydrocarbon concentration up to a molar excess of 14 to 1 and also with use of superatmospheric pressure. Addition of air or oxygen might be expected to favor the nitration reaction by displacing the equilibrium: $4\ HNO_3 \rightleftharpoons 4\ NO_2 + 2\ H_2O + O_2$ to the left. This effect is not noticed, however, due to the fact that at the temperatures used the reaction is displaced almost completely to the right; the nitration must occur before decomposition takes place.

In addition to all possible mononitro derivatives of the original alkane, some mononitro derivatives of its lower homologues are formed. Besides the nitrated products, alkenes and oxidation products, mainly carbon dioxide, aldehydes, acids and in some cases acetone, were found.[14,15] Although the ease of replacement of a hydrogen atom by a nitro group follows the scheme: tertiary > secondary > primary, the ratio of the various nitro compounds formed can be partly controlled by temperature and pressure variations. As the temperature rises the yield of primary derivatives increases, and the secondary and tertiary decreases.[12] The variation in yield may be due to a change in the relative reaction rates of primary and secondary carbon atoms with increased temperature.[13] The reaction may be less selective and the primary compound more stable at the higher temperature.[13] Nitro derivatives having fewer carbon atoms than the parent hydrocarbon were produced only at the higher temperatures.

To account for the nitro products having fewer carbon atoms than the original alkane, oxidation of the hydrocarbon to a fatty acid followed by δ-nitration of the acid and subsequent decarboxylation was considered a possible mechanism.[13] The decarboxylation mechanism was disproved since an δ-nitro acid could not be produced by either nitration of an acid or oxidation of a nitro compound under the conditions in vapor-phase nitration.[13] In all cases tried, McCleary and Degering found, besides the nitro products, all the alkenes predicted by the free radical theory of Rice for thermal decomposition of alkanes.[15,16] The expected variation of the quantity of alkenes and nitro products with change in concentration of the nitric acid was likewise obtained.[15] The mononitro compounds accounted for by a free-radical mechanism were found by other investigators.[13] McCleary and Degering, therefore, proposed the following mechanism as applied to nitration:

"A. The reaction appears to involve a free-radical mechanism. In nitrating with nitric acid the cycle may be:

RH + reactive fragment, or oxidizing agent → R + ?

Then

$R \rightarrow HO{\cdot}NO_2 \rightarrow R{\cdot}NO_2 + HO$

And

$R{\cdot}H{\cdot} + HO \rightarrow R + H_2O$, etc.

"B. Oxidation of the paraffin by nitric acid, or the thermal decomposition of some stable intermediate, gives free radicals which may be react as follows:

1. Decompose to form an olefin and a free radical of lower molecular weight which, in turn, could undergo any or all of the possible reactions of its predecessor, as

$R \rightarrow R' +$ olefin.

"2. Unite with a molecule of the nitrating agent to yield a nitroparaffin and an active fragment, as

$R + HO{\cdot}NO_2 \rightarrow R{\cdot}NO_2 + HO$

Then

$HO + R'H \rightarrow R' + H_2O$

And

$R' + HO{\cdot}NO_2 \rightarrow R'{\cdot}NO_2 + HO$, etc.

"3. Collide with a molecule of the parent paraffin and instigate a chain reaction, as

$R + RH \rightarrow RH + R$

Or

$R' + RH \rightarrow R'H + R$

"4. Unite with another free radical to form an alkane, as

$R + R' \rightarrow R{\cdot}R'$

And/or

"5. Become oxidized to carbon dioxide and water or to some oxidized intermediates.

"C. The oxidation products may be accounted for by assuming:

"1. Direct oxidation of the parent hydrocarbon, and/or

"2. Oxidation of the nitroparaffins, and/or

"3. Oxidation of free radicals, cleavage products, and olefins."[16]

Other investigators using pentane and 2-methylbutane isolated all the nitro compounds that could theoretically be produced by attaching a nitro group to the free radicals formed by loss of a hydrogen atom or scission of a carbon-to-carbon linkage.[17,13] Since there was no evidence to indicate the presence of any other nitro compound, the theory is partially confirmed.

B. Vapor phase with nitrogen tetroxide.

Vapor-phase nitrations have been carried out with nitrogen tetroxide on alkanes from methane to nonane, with the exception of ethane and butane.[18] Except for methane, the optimum temperature was about 200°. Such temperatures seem necessary for good yields.[20] Propane yielded a small amount of the secondary derivative, 2-nitropropane, in addition to 1-nitropropane and 1,3-dinitropropane.[20] Nitration of propane with nitrogen dioxide produced the same compounds as with nitric acid but conversions with nitrogen dioxide were lower.[21] High-temperature vapor-phase reactions of nitrogen tetroxide with the alkanes from pentane to nonane, however, gave primary products practically to the exclusion of the secondary.[22] Mononitro and dinitro compounds substituted on the end carbon atoms were obtained and usually formed in a ratio of mononitro to dinitro of about sixty to forty.[22] Other reaction products included aldehydes, fatty acids, and nitrolic acids.

C. Liquid phase with nitric acid and nitric-sulfuric acid mixtures.

Nitration in the liquid phase, although unsuitable for lower homologues, has been applied to alkanes of five or more carbon atoms using nitric acid or mixtures of nitric and sulfuric acids. Increased concentration of acid increases both oxidation and nitration and produces a relatively greater amount of di- and polynitro derivatives. More elevated temperatures and longer periods

(Continued on Page 41)

[10] Hibshman, Pierson and Hass, unpublished paper, Nitration of Ethane.
[11] Stettbacher, Tech. Ind. Schweiz. Chem. Ztg. 24, 265 (1941); C.A., 36, 4339 (1942).
[12] Hibshman, Pierson, and Hass, Ind. Eng. Chem. 32, 427 (1940).
[13] Hass, Hodge, and Vanderbilt, Ind. Eng. Chem. 28, 339 (1936).
[14] Gabriel, Chem. Industries 45, 664 (1939).
[15] McCleary and Degering, Ind. Eng. Chem. 30, 64 (1938).
[16] Rice, J. Am. Chem. Soc. 53, 1959 (1931).
[17] Hass and Patterson, Ind. Eng. Chem. 30, 67 (1938).
[18] Seigle and Hass, Ind. Eng. Chem. 31, 648 (1939).
[19] Urbanski and Slon, IIe Congr. mondial Petrole 2, Sec. 2, Phys., chim., raffinage 183 (1937).
[20] Shornigin and Topchiev, Ber. 67, 1362 (1934).
[21] Hass, Dorsky and Hodge, Ind. Eng. Chem. 33, 1138 (1941).
[22] Urbanski and Slon, Compt. rend. 204, 870 (1937).

of heating also produce higher yields of the dinitro product, which is probably formed by further nitration of the mononitro derivative.[23,24] Branched chain compounds containing tertiary atoms are more readily nitrated than the normal compounds, but a quaternary hydrocarbon compares with the normal series in lack of reactivity to nitric acid.[25] The substitution seems to take place on the secondary carbon adjacent to the quaternary group. Carbon dioxide and acetic, oxalic, and succinic acids were produced from alkanes and appear to be the normal oxidation products.[26] In some instances other compounds were formed such as fatty acids, nitro acids, δ-hydroxy acids, and aldehydes.[27,28,29,30]

A mixture of nitric and sulfuric acid has been frequently used as a nitration reagent. The sulfuric acid has been regarded merely as an agent to remove the water formed by the nitration reaction. The action of the mixture, however, is quite different from that of concentrated nitric acid. Markovnikov has obtained evidence that such a mixture contains nitro-sulfuric acid, $SO_2\begin{matrix}/OH\\ \backslash ONO_2\end{matrix}$, which is the active agent.[30] Volatile alkanes have been distilled over nitric-sulfuric acid mixtures without undergoing much reaction, although higher boiling normal alkanes reacted near their boiling points.[24,31] The acid mixture had little action on tertiary hydrocarbons a few degrees above zero in contrast to the action of nitric acid.[31]

Nitro compounds were produced from normal hexane to dodecane with dilute acid. Under pressure at 130°-40°, alkanes having 6, 7, or 8 carbon atoms yielded secondary nitro derivatives.[32,33] At atmospheric pressure these hydrocarbons with concentrated or fuming acid or nitric-sulfuric acid mixtures gave only primary products.[34] Other experiments with heptane and octane indicated that pressure had little effect on the course of the reaction.[32] As the molecular weight increased, nitration was accomplished with a more dilute acid. Increased concentration of acid increased the amount of di- and polysubstitution and of oxidation products. Dinitro compounds of hexane, heptane, and octane produced from the concentrated acid are thought to have the structure $CH_3(CH_2)_nCH(NO_2)_2$.[35]

The branched chain alkanes react much more readily than the normal compounds. Isopentane, isohexane, and isoheptane even produced trinitro compounds.[23,24] Alkanes of the type R_2CHCHR_2 (where R is CH_3 or any normal alkyl group) react readily with fuming acid.[31] 2,5-Dimethylhexane began reacting slightly above 0°, yielding a tertiary nitro product.[27,28] Higher temperatures are necessary when a more dilute acid is used. A slight variation in pressure had no effect.[25] Mixtures of nitric and sulfuric acids were less effective.[28] Experiments with 2,7-dimethyloctane substantiated several principles about nitration. Increased concentration of acid, in addition to increasing oxidation and the production of di- and polynitro compounds, also causes decreased production of tertiary derivatives and increased production of secondary and especially primary de-

[25]Konovalov, J. Russ. Phys. Chem. Soc. 31, 57 (1899); J. Chem. Soc. 76 (1) 844 (1899); Chem. Zentr. 70, I, 1063 (1899).
[26]Worstall, Am. Chem. J. 20, 202 (1898).
[27]Markovnikov, J. Russ. Phys. Chem. Soc. 31, 530 (1899); Chem. Zentr. 70, II, 473 (1899).
[28]Worstall, Am. Chem. J. 21, 210 (1899).
[29]Markovnikov, J. Russ. Phys. Chem. Soc. 31, 47 (1899); Chem. Zentr. 70, I, 1064 (1899).
[30]Markovnikov, J. prakt. chem. (2) 59, 556 (1899).
[31]Poni and Costachescu, ann. sci. univ. Jassy 2, 119 (1903); J. Chem. Soc. 84 (1) 596 (1903).
[32]Konovalov, J. Russ. Phys. Chem. Soc. 38, I, 109, 124 (1906); Chem. Soc. Abs. 92 (1) (1907); Chem. Zentr. 77, II, 313 (1906).
[33]Markovnikov, Ber. 32, 1441 (1899).
[34]Konovalov, J. Russ. Phys. Chem. Soc. 25 (1) 889 472 (1893); Ber. 26, Ref. 878 (1893); J. Chem. Soc. 66 (1) 265 (1894).
[35]Konovalov, Compt. rend. 114, 26 (1892).
[36]Francis and Young, J. Chem. Soc. 73, 928 (1898).

(Continued on Page 44)

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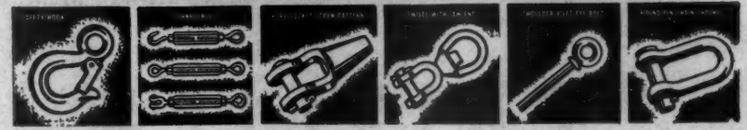

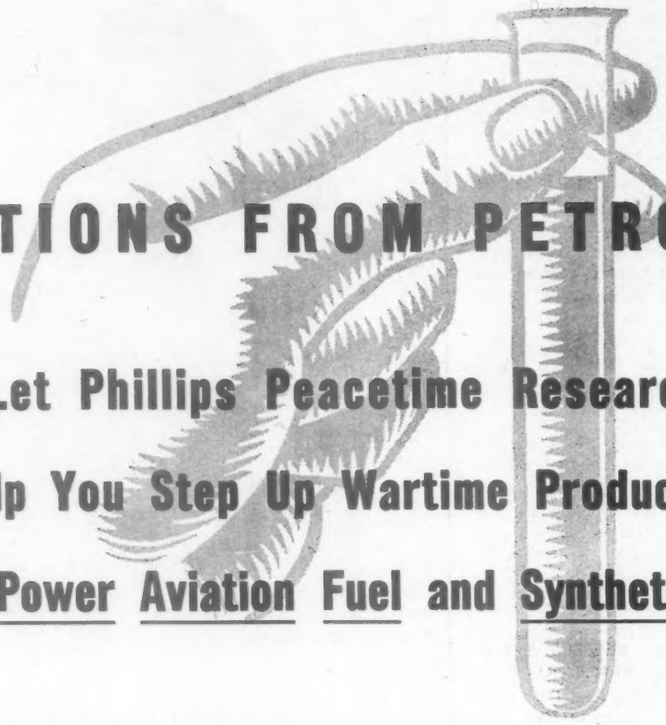

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Of vital importance to those who can use these commercially proven processes is the fact that Phillips research scientists are constantly studying these processes, constantly checking different combinations of charge stocks, catalysts and operating procedures in search of means to increase the production of these processes and to increase their contribution to the war effort in other ways. Thousands of laboratory and pilot plant tests have been completed, and on the basis of this tremendous background of experience, tests are continuing along the lines that show the greatest possibilities.

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R-S Streamlined BUTTERFLY VALVES

rivatives.[80] The primary derivative was practically the only nitro product formed in some cases from the concentrated nitric acid.

The mechanism of nitration apparently involves removal of hydrogen as an atom rather than as a proton or negative ion.[81] The acceptor-donor inversion mechanism seems most plausible since it is supported by the greater substitutive reactivity of tertiary carbon atoms, the electron repulsion of tertiary groups, and the absence of rearrangement.

D. Catalytic.

In the vapor phase nitration with nitric acid, potassium nitrate coating of the walls catalyzed the reaction.[18] The function of the potassium nitrate may be an inhibition of the competing oxidation by diminishing the stainless steel surface which catalyzes the oxidation. In liquid phase nitrations, aluminum and bismuth nitrates increased the formation of 1- and 3-nitro derivatives of 2,7-dimethyloctane.

Alkanes react with nitric oxide at high temperatures in the presence of a catalyst.[86] With mixtures of the oxides of aluminum, cerium, and thorium at 400°-600°, *n*-pentane, -hexane, and -heptane produced 2 per cent of primary nitro compounds. Cracking also occurred producing unsaturated hydrocarbons. Methane reacted with nitric oxide in the presence of a catalyst to give hydrocyanic acid.[87] The reaction began around 900°, and the yield increased with temperature.

[80]Stevens and Schiessler, J. Am. Chem. Soc. 62, 2885 (1940).
[81]Platonov and Shalkind, J. Gen Chem. (U.S.S.R.) 4, 434 (1934): C.A. 29, 1769 (1935).
[87]Elod and Nedelmann, Z. Elektrochem. 33, 217 (1927).

●

Care and Use of Taps

Taps are used to cut an internal thread in various types of metal. There are several forms of threads and many kinds of taps used to cut these threads. The forms used are the American Standard or National Coarse, the S.A.E. or National Fine, the Whitworth or British Standard, Briggs or Pipe, Acme, and Square. Some familiar kinds of taps are: standard hand taps, serial hand taps, two and three-fluted hand taps, staybolt taps, standard machine screw taps, tapper taps, taper pipe taps, straight pipe taps, etc.

All the standard forms of taps are designed to produce a satisfactory thread in the more commonly used materials. However, these taps may not give best results in special alloys and for this reason specially designed taps should be used.

Generally speaking bolt taps are used as a set of three. The set consists of a starting or No. 1 tap, a plug or No. 2 tap, and a bottoming or No. 3 tap. These taps should always be used in the order named. This prevents breakage of taps, and at the same time cuts a cleaner thread.

There are many precautions which should be noted in regard to the care and use of taps:

Use the correst size tap drill to make the hole.

Don't forget to use thread-cutting oil.

Back off every revolution in order to break off the chips.

Use bolt taps in order. Don't use a No. 2 or No. 3 tap as a starter. Don't skip from No. 1 to No. 3 tap.

Make sure tap is sharp or it will tear material.

Clear chips out of hole to prevent tearing threads.

Use standard tap wrench of proper leverage; do not add leverage.

Never use a pipe wrench to drive a tap.

A standard tap of any size takes months to obtain, odd sizes 6 months to a year. In many cases it is necessary to make them in local shops. Again there may be trouble obtaining material, as the steel for taps is of special alloys. Supervision should be certain when these tools are used that the person using them has been properly instructed in operation and care.

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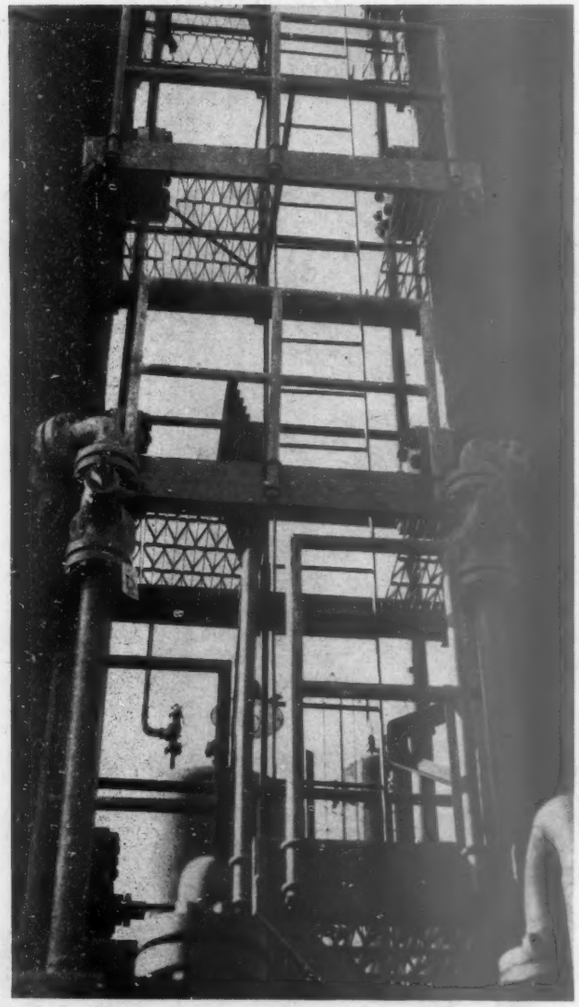
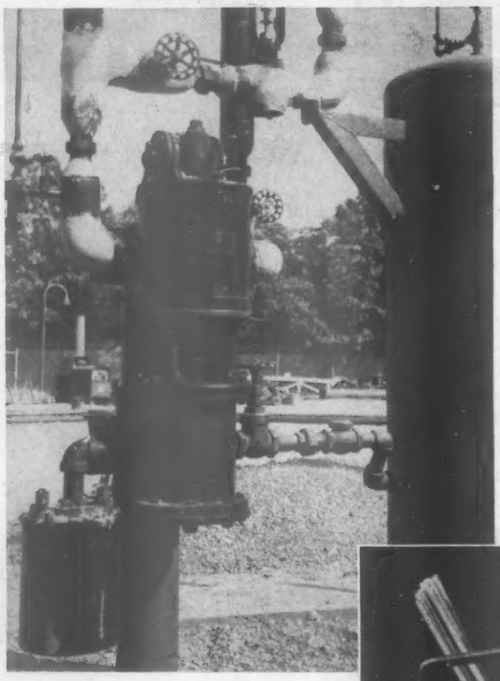


Platform Between Towers Promotes Safety When Cleaning

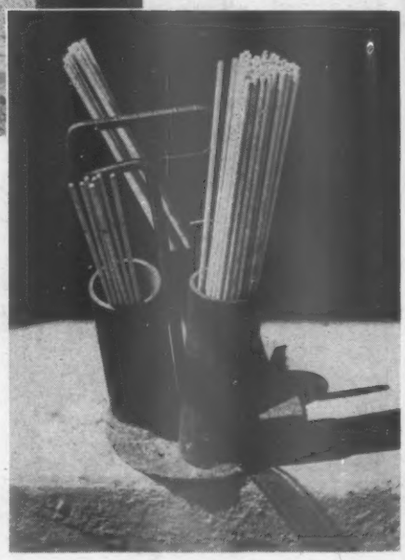
The location, between two fractionating towers, of a series of platforms from which operators may service the tower trays, the use of a single ladder to reach all levels, and the use of heavy railings, meet the refiner's demand for safety in an unusually effective manner. Each platform shown here is cut and hinged in part to provide a continuous opening in front of the ladder. Normally, these hinged sections are held open to permit access to the upper portion of the tower but wherever men are working, the platform on that level is lowered and the men are entirely protected against fall. Note the substantial manner in which the side rails are held in place on each level.

Old Locomotive Pump Set Up Outside



The refinery salvage depot is not the only place in which to find used equipment that can go into new installations to save metal and get the job done. Here the operator reconditioned an old, vertical locomotive air pump and mounted it on a post near the equipment to be served. The overhead steam lines made its installation relatively simple and the rugged construction and design of the pump made its use here economical.

Welding-Rod Kit →



Three types of welding rods are held in a convenient manner in a kit made of reclaimed material. Rods are held in short pieces of 2½-in. tubing which have been spot welded to a piece of ⅜-in. steel which forms a base. The tubes are placed at an angle which makes it easy for the welder to pick them out. A handle in the center may be picked up readily when the kit is moved.

Compare Performance of Valve Seats

Anxious to determine whether built-up welded surfaces or newly installed prefabricated steel seats were more serviceable in a series of engines, one company has installed one of each in the combustion end of the same engine. This will, as nearly as possible, duplicate conditions on the two seats, although slight differences of temperature will exist, of course. The valve seat shown on the left has been built up with welding rod while that on the right has been installed as a unit, the steel ring having been shrunk by chilling and then allowed to expand in place on the machined surface of the engine cylinder. No attempt is made here to evaluate the relative merits of the two methods but it becomes apparent that each offers advantages and disadvantages. One requires a skilled welder, while the other does not.

★ ★ ★ ★ ★ ★ ★ ★ ★

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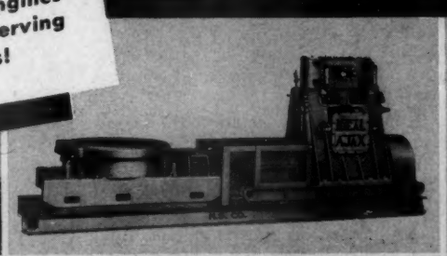

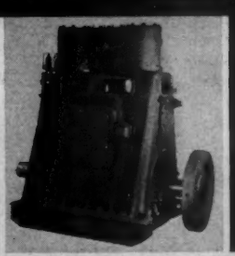

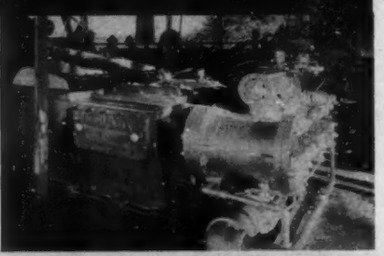

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OPC Issues Recommendations On Use of Refinery Instruments

Among its many duties the refinery division of the Office of Petroleum Coordinator for War acts as a clearing house for information explaining how builders and operators of refineries can secure the maximum use from materials and equipment. This article which was made available by Max B. Miller, chief of the construction section of the refinery division deals with the operation of control instruments.

BECAUSE of the growing critical shortage of necessary refinery instruments, three recommendations are made. They are:

1. Use every possible instrument on hand before purchasing or trying to purchase new instruments.

2. In purchasing new instruments, try to standardize and simplify your requirements as much as possible.

3. Try to spread your orders for instruments among as many manufacturers as possible.

The reasons for these recommendations may be discussed as follows: The partial discontinuance of research work and the temporary shutdown of refinery equipment used heretofore for the production of normal products should make many instruments now installed available for wartime-plant construction. Ordinarily, it is not the practice of refiners to strip units which are temporarily shut down. Under today's conditions, however, one can see no objection to the salvaging of instruments by that practice.

While it is true that instrument manufacturers use critical materials, that is not the primary difficulty in securing instruments. The principal difficulty in securing sufficient instruments comes from the lack of capacity of the shops engaged in the manufacture of them. It is thought, therefore, that if all orders for instruments could be confined to standard apparatus which has been simplified to the greatest possible extent, more instruments could be manufactured in each shop. It is therefore suggested that in cases of necessity where special instruments are required, the purchaser should consult the representative of the instrument manufacturer before ordering specially constructed or fancy types of equipment.

Eliminate Special Cases

Some suggestions with regard to this particular subject come to mind. There seems to be no reason why a wartime plant should not eliminate from instruments special cases, special painting, special clocks, special mountings, and, more particularly, special chart ranges. The use of unnecessary dial or industrial thermometers should be eliminated wherever possible. The use of small, cheap types of indicating pressure gages does not involve critical materials. When drawing specifications for relief and safety valves, high-alloy-steel springs unless absolutely necessary should be cut out. Because of the difficulty in securing steel forgings, we strongly recommend the use of cast iron for diaphragm motor-control valves wherever possible.

The spreading of instrument orders throughout the entire instrument-manufacturing industry and among the small as well as the large concerns should help the situation immensely. It is going to take everyone in the instrument industry to do the instrument job. It would help immensely if all erectors employed all instrument manufacturers.

W. K. McCoy, instrument specialist of this office, has made a number of recommendations relative to the installation of control valves which should be helpful in connection with this problem. These recommendations follow:

As an emergency measure, the following type of control-valve installation is recommended in order to partially compensate for an acute block-valve shortage.

The valve installation as shown in Fig. 1 is designed to eliminate the use of three block valves as well as the pipe and fittings which are necessary to make up the ordinary by-pass assembly. This installation is recommended for conditions which make it necessary to install a 2-in. or larger sized valve.

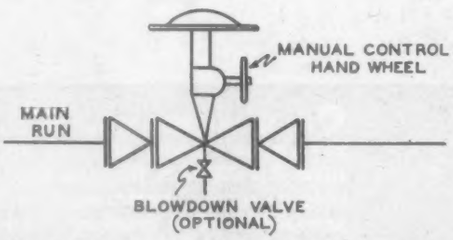


Fig. 1—Diaphragm motor valve with continuously connected manually operated hand wheel

The control valve should have the continuously connected manually operated hand wheel attached in order to facilitate hand operation in case of air, diaphragm, or instrument failure. By virtue of this hand-operating mechanism, the valve may be opened, closed, or set at any desired position if manual control of the fluid flow is necessary.

A number of valve manufacturers have the manual hand-control wheel mechanism so designed that it is possible for the operator to control the flow of fluid even while the instrument is endeavoring to control the valve. The design also includes limit stops which make it possible to limit the valve-plug travel to any desired per cent or portion of the total valve-plug travel.

There are a few operating conditions where the previously mentioned installation may not be possible, due to the possibility of the valve becoming plugged. If such an installation is deemed absolutely necessary, the arrangement shown in Fig. 2 is recommended.

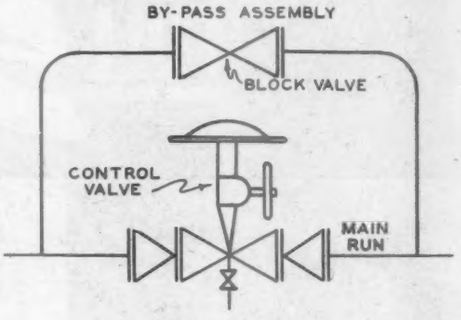


Fig. 2

In this arrangement the control valve should be installed in the main run rather than in the by-pass. It is necessary to concentrate the maximum pressure drop across the control valve rather than distribute it across a number of fittings as would be the case if it were installed in the by-pass. Since the control valve is in operation 99 per cent of the time the process is "on stream," the over-all efficiency of the operation will be increased by installing valve as shown in Fig. 2.

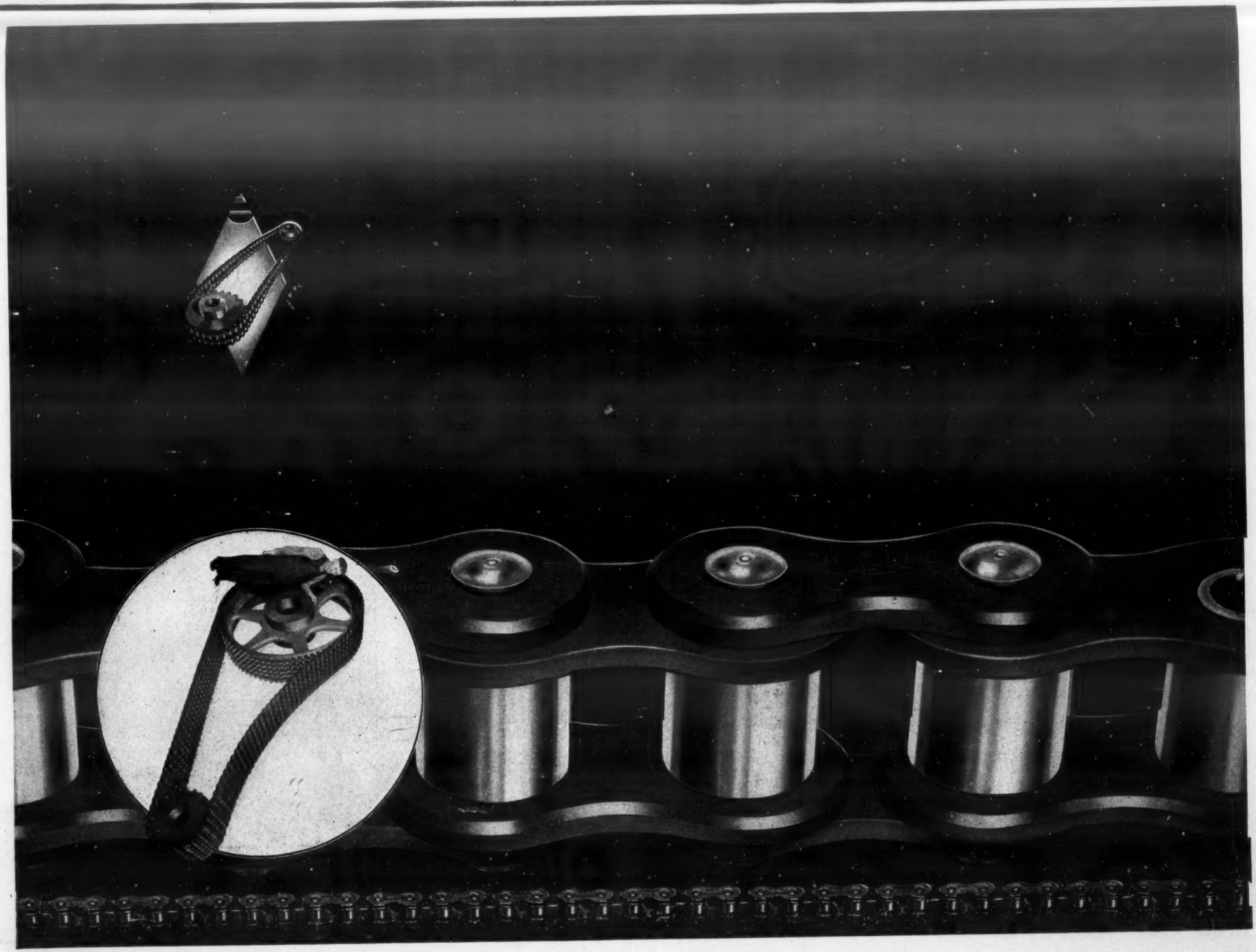
Valve Failure

With regard to valve structural failure, in most cases by-pass block valves cannot be reached because of the danger and are of little use in shutting off the fluid. The line is usually shut off at some point more distant from the failure or trouble.

The economy realized by elimination of by-pass assemblies and the use of this valve design is of such magnitude it should warrant the consideration of any erector.

In view of the fact that a number of companies have installed properly sized control valves without by-pass assemblies or block valves on a number of units and have experienced negligible difficulty with regard to shutdowns because of valve failure, such installations are recommended by this office from a material savings and economic standpoint.

While the foregoing discussion deals with the manual-control hand wheel as an emergency proposition, we believe that the manually operated control valve is a definite improvement over



TYPICAL OIL-FIELD STRUCTURES

Truncated Shore Line

East Texas Field, Texas

(Compiled by The Oil and Gas Journal)

GENERAL GEOLOGY: The East Texas basin was originally continuous with the Mississippi River embayment and bordered the folded Paleozoic continent formed by the uplift of the Appalachian and Ouachita mountains. In different times during the Mesozoic a large area within the basin was uplifted to form the Sabine uplift, which divided the larger embayment into two smaller ones. These were connected by way of a narrow channel around the north end of the uplift.

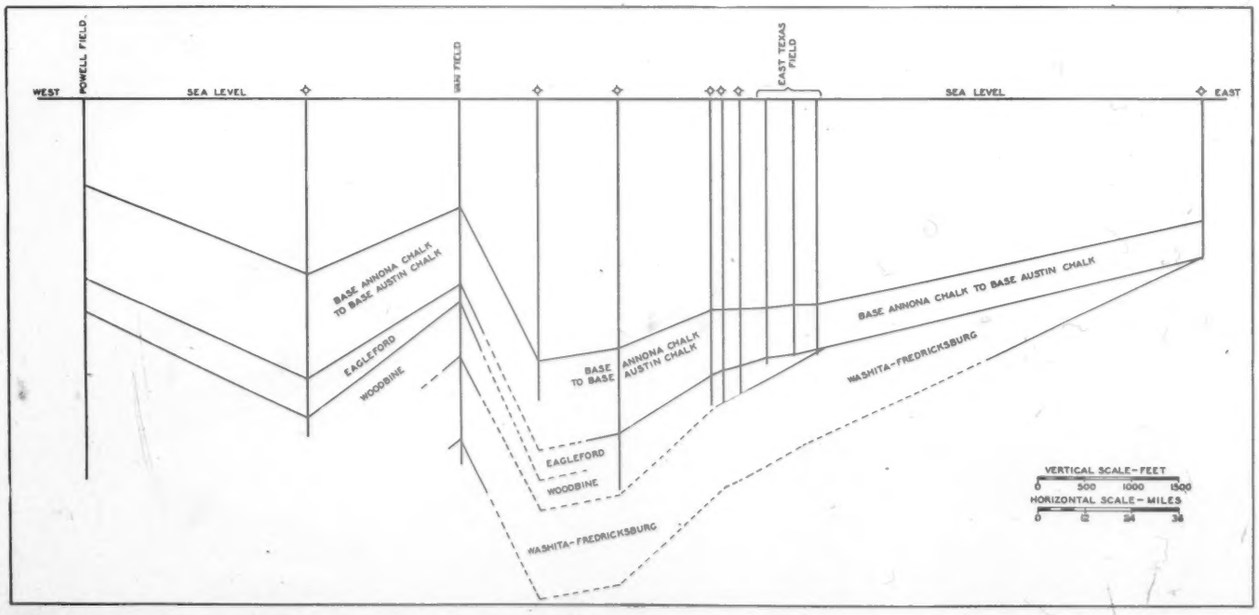
Filling of the basin and slumping towards the coast resulted in the formation of a belt of faulting, known as the Balcones-Mexia zone as well as other local features such as the Angelina flexure to the south of the Sabine uplift and a number of salt domes within the basin. As the basin slowly subsided, the Sabine uplift was differentially raised so that many of the formations do not cover it but pinch out against the flanks.

STRUCTURE: The pinching out of formations against the flank of a structural high indicates an advance of the sea which may be continuous or oscillatory. In the case of advancing sea sands and clays are deposited in an overlapping pattern so that stratigraphically higher sands terminate higher on the regional high than older formations. In the case of an oscillating shore line caused by alternating advances and retreats of the sea, conditions are much more complex. In East Texas, the Lower Cretaceous sea extended completely across the arch and at the close of the period retreated to the west of the present East Texas field. At this time, the exposed area was subjected to erosion resulting in the formation of coarse clastic material which was deposited as the Woodbine sand as the sea readvanced. Possibly following the deposition of this sand and certainly following the deposition of the overlying Eagle Ford shales, the sea again retreated and sufficient erosion took place to remove a part of the sand in the area now occupied by the field and all of the Woodbine that extended to the east. Later formations, beginning with the Austin chalk were deposited in subsequent readvances.

OIL-BEARING HORIZON: The Woodbine sand provides the only reservoir in this area and because of the regional structure, the existence of any deeper pays would be coincidental as they would probably also be stratigraphic traps of the same type as East Texas and the development of one of these traps directly over another is very unusual, although, of course, not impossible.

The Woodbine sand is not a blanket sand in the East Texas field but is in large part nonmarine and includes silts and ashy and conglomerate material. The origin of most of this material was probably continental and as the sea advanced over the eroded land area it reworked the detrital material lying on the rock surface carrying some of the finer fragments out to sea and leaving most of the coarse material behind. This resulted in irregularities, both horizontally and vertically, so that the reservoir is made up of a great number of lenses which overlap in such a way as to provide a continuous producing area. Connection between the various lenses is now maintained by the wells in the field which explains the relatively uniform water encroachment as well as the fact that many wells below the present general water level still produce oil.

ORIGIN OF THE OIL: The widespread presence of oil in the Woodbine sand in the East Texas embayment strongly suggests that the oil was formed in this formation. It is improbable, however, that the oil or oil-forming material was deposited with the sand or it would have been removed



Section across the East Texas basin from the Mexia fault zone to the Sabine uplift, showing the pinching out of the Eagle Ford and Woodbine formations

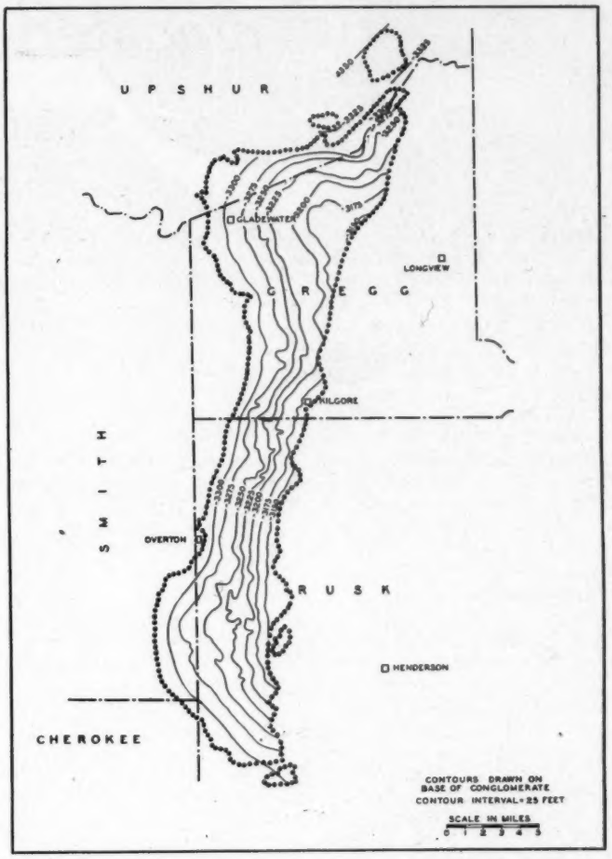
during the period of weathering following deposition of the Eagle Ford. It is possible that it was formed deeper in the basin and migrated into its present position at a later time. If this were the case, other accumulations would have formed in places where the Woodbine pinches out on other parts of the uplift but none have been found. An alternative suggestion is that the oil-forming materials entered the Woodbine on its second submergence beneath the sea, in which case the only possibilities for a similarly situated field would be where the conditions of submergence were also similar.

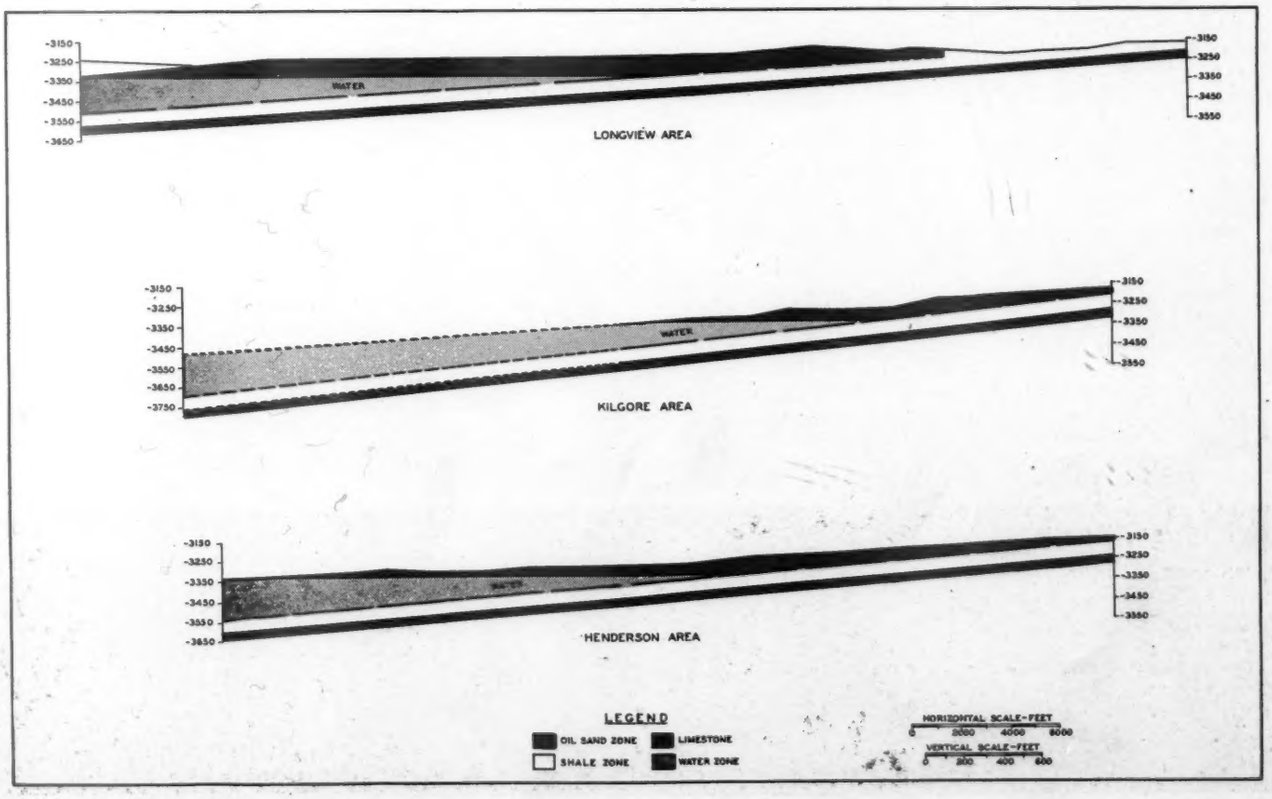
OTHER FIELDS OF THE SAME TYPE: There are a great many wedge-edge fields which formed near shorelines of advancing seas but it is difficult to demonstrate that these reservoirs were developed in the same way as in East Texas. Every area which projected above sea level for even a short period, geologically speaking, presents possibilities for flanking sands which may form oil reservoirs. Sands of this type form the basis for the numerous trend plays along the Gulf Coastal area. They have provided major fields in the San Joaquin and Los Angeles basins of California and eastern Kansas and Oklahoma. The Chester sands of Illinois are mainly wedge-edges or near-shore deposits which produce on structure.

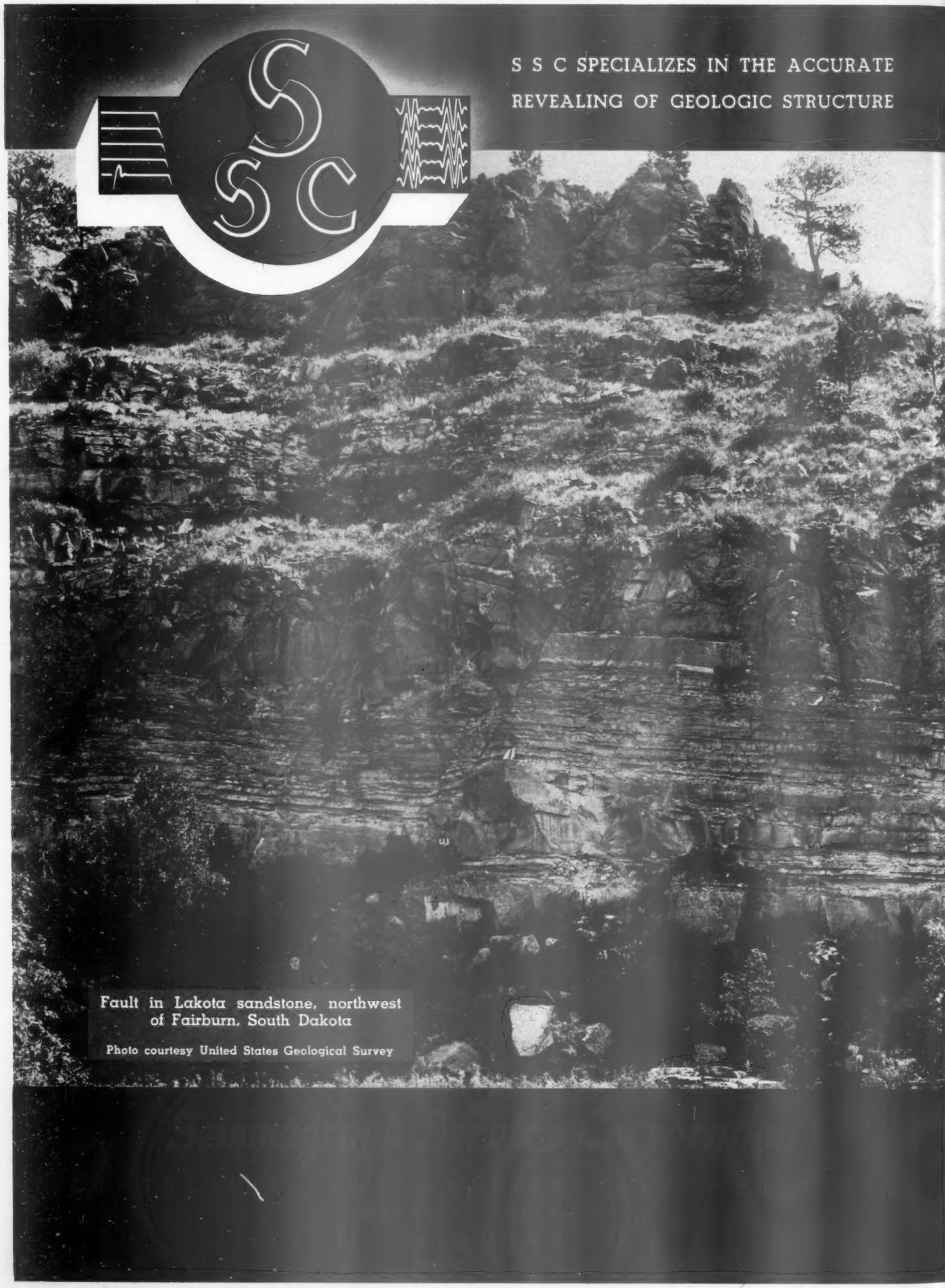
EXPLORATION METHODS: Surface methods give little or no indication of wedge-edges, whether truncated or not. Convergence studies based on deep wells frequently show the approximate location of wedge-edges. Truncation of these wedges, as in the case of East Texas, might be inferred if a well which should penetrate the sand fails to find it. In this case, drilling progressively down the dip will eventually pick it up, a process which would involve leasing and exploration costs far in excess of the return to be expected. The seismograph is used to pick up wedging sands either on the strength of convergence of key beds above and below or by direct reflections from the sand.

Right: The East Texas oil field contours on base of Austin chalk conglomerate. Below: Cross-sections across the East Texas field showing the irregular upper surface of the Woodbine sand and the original oil-water contact

Principal references: H. E. Minor and Marcus A. Hanna, East Texas Oil Field, Rusk, Cherokee, Smith, Gregg, and Upshur counties, Texas, Stratigraphic Type Oil Fields, pp. 600-40, and East Texas Oil Field, A.A.P.G., Bull. Vol. 17, No. 7, pp. 757-92.






S S C SPECIALIZES IN THE ACCURATE
REVEALING OF GEOLOGIC STRUCTURE
Fault in Lakota sandstone, northwest of Fairburn, South Dakota
Photo courtesy United States Geological Survey

the so-called by-pass valve. All of the worries such as the joints involved, the leaking of the valve stems on the block and by-pass valves, and the worry as to whether or not these valves are tight, are eliminated. However, one should be particularly careful in the sizing of these valves. It would be our recommendation, based on considerable experience, that a control valve should be sized so that it would pass twice the normal expected flow rate at the normal expected pressure drop across the valve. We believe that the present high-lift V-port or parabolic plug types of inner valves will give very fine performance under these conditions.

We would suggest that every effort be made to reduce the number of control-valve precision relays (valve-actors, valve-precisors, etc.). Please do not use this equipment unless the instrument with which it will be used is operating with an extremely wide throttling range or where there is extremely high pressure drop across the control valve or the material being handled is such that precise valve action cannot be obtained with the standard diaphragm head.

Do everything possible to prevent the specification of diaphragm motor-control valves with special spring ranges or diaphragm heads.

In the use of liquid level controllers, please use the simplest type possible and wherever possible use cast-iron float cages. Do not request special internal trim or parts and, of course, reduce the amount of critical materials such as chrome, nickel, and copper to an absolute minimum.

On flow-measuring instruments, do not specify special differential-pressure ranges or suppressed-range instruments or any specification which will require other than assembly-line production of that particular instrument.

In ordering pressure-measuring instruments, please do not deviate from instrument companies' standard specifications.

Specification of Pyrometers

In temperature-recording instruments, please conform as closely as possible to the standard specification of the instrument manufacturers. This is particularly true in the reinforcing required on the capillary tubing, changing of bulb diameters, changing the chart spread in degrees.

In the specification of pyrometers, we believe that sufficient ranges and types have been developed to handle all the general classes of refinery equipment now being built. Therefore, we request you not to deviate from the specifications of the instruments which are usually purchased for this type of equipment. We do not believe it necessary to specify special time cycles or special types of characters on the printing mechanism. Further, please use a multipoint indicating pyrometer to measure all but the most essential temperature points, thereby saving a number of recording instruments.

Referring specifically to the pneumatic-transmission type of instrument, we are firmly convinced that the installation of such an instrument requires greater engineering time, certainly greater maintenance, and results in poorer control. The increased cost of this type of instrument is such that safer operating conditions can be obtained in the control room by the forced circulation of air in the control room rather than the relying upon these instruments to keep all noxious vapors from the room.

We wish to point out that the use of pneumatic transmission instruments requires additional air lines running to that instrument, that the transmitter requires special mounting, and that the transmitter must be protected. Further, the calibration of such instruments is certainly not a simple procedure and the cost of such an instrument cannot be justified on the basis of saving capillary tubing or piping. It is true that with the use of a pneumatic transmission system the primary measuring element can be located close to the source of the measured pressure. However, we are firmly convinced that if a unit is built around its pump house and main control board and if the instrument engineer pays sufficient attention to the detailing of the piping of the unit, 90 per cent of all of the pressure measure points can be located within the working range of a standard instrument, which in turn would be located on the main control board. We further believe that such attention to detail on the part of the instrument engineer will result in not only decreased cost of the instruments but will also decrease the cost of the actual piping involved on the unit. Several of the major refining organizations are following exactly this procedure at this time, and the results have amply demonstrated that the efforts on the part of the instrument engineers are well worth while.

A suggestion which we would like to make, and this applies most particularly to static or differential-pressure types of instruments, is the use of inert gas blow-back systems with standard instruments. The chemical industry is very successfully using this particular device, utilizing CO_2 or N_2 as the case may be. This type of installation has several advantages over pneumatic-transmission equipment. It permits the use of a standard instrument which can be located any distance up to 500 ft. from the pressure source. It eliminates the necessity of seal pots and also the necessity of using large valves, fittings, and heavy seamless-tubing lines. The chemical industry has very satisfactorily used long sections of ⅛-in. seamless-steel tubing with relatively small bore. The use of such blow-back systems permits the installation of orifice plates in almost any position where a sufficient straight length of pipe can be obtained. It also eliminates the necessity for correcting pressure-gage measurements for static liquid heads. It permits the use of small needle valves because the question of plugging and leaking at the valve stem worries is eliminated. It reduces maintenance because there are no corrosive or dirty fluids getting into the manometer or primary measuring elements.

It is believed that an investigation as to the economics of using a gas blow back will indicate that savings involved in the reduction of cost of the instruments themselves, in the cost of the installation of these instruments, and in the reduction in maintenance will far more than offset the cost of the gas used for the blow back. Many of the refineries already have inert gas-generating equipment available which could be used for this type of instrument installation. (Experience has shown that approximately ½ to ¾ of a cubic foot per minute of gas is used per instrument lead.)

Questions and Answers

What is the normal rate of corrosion of carbon steel in salt water? Which materials used in oil wells are anodic and which cathodic?—S. F. H.

H. R. Copson in his paper, "Galvanic Corrosion of Dissimilar Metals in Salt-Water Solutions," A.P.I., Fort Worth, Tex., meeting, 1940, gives a normal rate of corrosion of carbon steel in artificial sea water as anywhere between 16 and 1,000 mg. per sq. dm. per day.

The galvanic series for oil-well materials in artificial sea water according to Mr. Copson is as follows: Anodic (corroded) end, Grade C normalized, Grade D normalized, Grade C as rolled, Grade D plus molybdenum, chromium-silicon-copper-steel, S.A.E. 4140, S.A.E 3140, 14 to +18 per cent chromium steel, nickel, brass, 18-8 stainless steel—cathodic (protected) end.

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QUESTIONS ON TECHNOLOGY

By W. L. NELSON, Technical Editor

W. L. NELSON

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to W. L. Nelson, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists, and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible. Inquiries must be signed but only the given initials will be printed. The source of the question is considered to be confidential.

Questions requiring a discussion of patents, extended computations, or a detailed study cannot be considered. When the matter is of general interest, a reply will be published within a reasonable time.

Additive for Increasing Viscosity Index

In your issue of July 30, you mention paratone as a viscosity index improver. Can you give us the name of the manufacturer and tell us more of this material?—J. C. W.

The viscosity index of an oil is an important characteristic in many respects. Major among these are (1) ease of starting at low temperatures, (2) faithful lubrication at low temperatures, particularly before the engine has become entirely warm, (3) lower oil consumption because the piston seal is maintained more completely with oils that maintain their viscosity at high temperatures, (4) somewhat less tendency to produce sludge at least as far as sludging is related to blow by, and (5) perhaps better power due to better piston seal. Of course, most of these characteristics can be obtained in oils that do not have a high viscosity index, providing too great a range of climatic temperature is not encountered.

Paratone and similar additives of the isobutene polymerization type are high-viscosity materials which vitally affect the rate of change of viscosity of an oil. It acts most vigorously on low viscosity-index oils but the total quantity additive required to bring such oils to 100 viscosity index, is large. The effect of paratone on the viscosity index of average types of oils is somewhat as follows:

VISCOSITY INDEX

(Viscosity at 210° F.)

Per cent additive	Paraffin base			Mid-Continent base			Coastal base		
	43	55	75	43	55	75	43	55	75
0	100	100	100	80	80	80	0	0	0
4	118	111	106	108	96	91	87	55	47
8	129	117	111	120	105	101	109	80	71
12	135	122	114	126	115	108	116	95	87
16	137	125	118	128	119	112	120	102	95
20	138	127	121	129	120	113	124	105	98

This type of viscosity-index improver acts by increasing the viscosity of the original oil—and to a greater degree at high temperature than at low temperatures. Thus, the viscosity of a 75 viscosity at 210° F. coastal type oil is affected as follows by the addition of paratone:

Per cent additive	Viscosity, S.S.U. At 100° F.	At 210° F.
0	1,230	75
2	1,500	90
6	2,100	120
12	3,170	172
22	....	322

This tabulation indicates clearly that the viscosity is greatly increased as well as the viscosity index, and that the base-stock oil must have a lower viscosity than would normally be required.

Except for changes in the viscosity index, viscosity, and a slight darkening in color, the use of these additives does not vitally affect the other physical tests such as flash point, gravity, pour point, etc. Engine tests also indicate that paratone itself has no direct effect on the performance of the oil, but of course the paratone does contribute indirectly to the properties as mentioned above.

Hoops for Wood Tanks

We are finding it necessary to substitute wood tanks for steel tanks in many services. How can you determine the number of hoops needed and the size of them for large tanks?—L. E. S.

Although the stress in the hoops of a tank is fundamentally related to the stress (in a circumferential direction) formulations for thin-wall cylinders, it is necessary in this case to resort to a somewhat empirical relationship as shown here: in which—

$$N = \frac{0.25\,H^2\,Dd}{AS} + V$$

N is number of hoops

H is depth of tank, ft.

D is inside diameter, ft.

d is density of fluid, lb. per cu. ft.

S is allowable stress in steel of hoop, lb. per sq. in.

A is area at root of thread, sq. in. (of hoop)

V is a constant having a value of about two for small tanks or six for large tanks.

The hoop spacing should not be greater than 18-21 in.

For a 30-ft. diameter tank 20 ft. in height, full of water and using round steel hoops having a root diamater of ¾ in., the number of hoops would be—

$$N = \frac{0.25 \times 400 \times 30 \times 62.4}{0.5625 \times 0.786 \times 16{,}000} + 3.5 = 30$$

Thus, for this arrangement, 30 hoops at a spacing of about 8 in. are required.

More on Analytical Determinations Of Butadiene and Other Dienes

Note: In reference to the item "Determination of Butadiene Stock for Rubber Manufacture" in the January 22, 1942, issue of The Oil and Gas Journal, the following suggestions or cautions were received on the use of the maleic anhydride method from Richard F. Robey, who is chairman of the subcommittee on analysis of the technical advisory committee of the Petroleum Industry War Council.

Although maleic anhydride is commonly used as a selective reagent for the conjugated diolefins in gasolines and other hydrocarbon mixtures from cracking, it is not generally known that certain dienes fail to respond.

Farmer and Warren[1] early showed that 4-methyl-pentadiene-1,3 fails to form the expected simple adduct with the anhydride. Since that time other observations reported in the literature indicate that dienes with doubly substituted carbon atoms in the terminal (1,4) position of a conjugated system $RRC = C - C = CRR$ either give polymeric adducts or, under antioxidation conditions, no appreciable reaction of any kind.

More recently the writer and his coworkers reported that the *cis* isomer of pentadiene-1,3 fails to show significant reaction with maleic anhydride.[2] Since pentadiene-1,3 (piperylene) is the first member in the homologous series of conjugated dienes to exhibit geometrical isomerism, there seems little doubt that analogous isomers of higher dienes will behave similarly although this has not yet been proved. The writer has also observed in the case of piperylene that the *cis* isomer is much more prominent in mixtures from high temperature processes.

[1] Farmer and Warren, J. Chem. Soc. 3221 (1931).

[2] Robey, Morrell, and Wiese, J. Am. Chem. Soc. 63, 627 (1941).

CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

RIG OPERATION

OCTOBER 15, 1942

SAVING OF STEEL COSTS THROUGH DRILLING-MUD CONTROL

ALTHOUGH attempts by oil operators to drill both exploratory and exploitation wells with the minimum amount of casing started in the early 1930's, it began to be an economic as well as a mechanical success with the advent of drilling-mud control. During the emergency created by the war, everyone has become increasingly conscious of steel and how to save it, and hence there is even a greater premium placed on the substitution of a controlled mud program for casing steel.

Originally, an operator thought only of controlling drilling mud when his hole gave trouble. Drilling mud was looked on, in its early life, as an additional expense incurred as the result of a blowout, bad fishing job or similar experience. As things progressed men found by watching the characteristics of their drilling fluids they were able to drill sections which were troublesome on earlier wells in the area.

These men were perhaps the first mud engineers. The Gulf Coast and its mechanical problems developed mud techniques more quickly than any other area. However, deeper drilling generally, and the economics involved in reducing the number of strings of casing necessary, put more and more emphasis on the problem of mud control.

It is difficult to set out actual tangible savings on drilling wells as the result of a controlled drilling-mud program. Some idea of the savings can be gained from type examples and those familiar with drilling economics will recognize them immediately.

Rig time and steel shortage due to the war emergency are the most expensive items in drilling wells today. Many engineers have proven to their own satisfaction that drilling the well with a good drilling fluid will result in a cost only a small fraction of that necessary when trying to protect the hole with an intermediate string.

In addition to the savings through the elimination of unnecessary casing, there are also those accruing from the prevention of stuck pipe, ability to fish for lost pipe for long periods of time without danger, and an increased rate of penetration resulting from the maintenance of a sound mud program.

An example of casing saving can best be obtained by citing a recent Mid-Continent test. This particular well was drilled to a total depth of 10,157 ft. with less than 300 ft. of 16½-in. o.d. surface pipe. This was the only string of pipe run in the well during drilling and testing operations. Normally on such wells the oil company sets up in the budget $20,000 for approximately 3,500 ft. of 9⅝-in. pipe for protective casing.

The time required to drill this well was approximately 4½ months. The section penetrated consisted of a long series of Permian and Pennsylvanian sands and shales. Knowing that the well was to be a deep test, the operator set out a definite mud program to be followed. The mud was to be carried at a weight of 10 lb. per gal., viscosity from 36 to 38 seconds A.P.I., and water loss at a maximum of 25 cc. at 100-lb. pressure for 30 minutes. Actually, no difficulty was experienced in keeping the water loss to an average of 20 cc.

Continuous dilution with water was necessary to hold the weight at 10 lb. per gal. It was the established practice on the well to add enough colloidal clay to the system to protect the mud from this water dilution. This required 2 per cent by weight, or approximately 700 lb. of colloidal clay per 100 bbl. of water added. The viscosity was easily maintained at the desired figure with the colloidal additions and the water was in direct proportion to these gel additions.

At approximately 7,500 ft. a tank was set up and 2 per cent colloidal clay-water mixed so that all pit additions could be closely controlled as an added protection against over dilution and wetting of the shales.

During the drilling of the well there were two fishing jobs either of which could have been extremely expensive in a well carrying so much open hole. Six days time and numerous trips were required at approximately 8,600 ft. to clean up junk lost in the hole. While drilling at 9,800 ft. the drill pipe twisted off leaving eight joints and the drill collars and bit in the hole. In less than 20 hours, the overshot had been run, the fish recovered and a new bit was back on bottom drilling.

In order to test the possible producing zones encountered, numerous cores were taken, a drill-stem test was made and the hole was electrically surveyed on four different occasions. Another week's time was expended in replacing drilling equipment with a heavier type when the hole was projected to a greater depth. All of this was accomplished without any trouble and is cited to emphasize the perfect condition of the hole at all times. All routine operations were carried out as if the well were protected by casing.

Actual mud expenditures on this well were approximately $800 and another $100 can be charged to moving in and setting the mixing tank. The total cost of the mud program can be set at $900 or $0.09 per foot of hole. Using the average amount of casing normally allotted to such tests would have resulted in spending $20,000, or $2 per foot as based on a hole 10,000 ft. deep. This shows a saving of $19,100 over the average cost experienced on wells of this type.

Normally, it is necessary to spend four times as much money to cure mud troubles after the difficulty has arisen as it is to prevent it through proper mud conditioning applied continuously. A well to 4,200 ft. in the Mid-Continent can generally be drilled with a total of 60 to 80 sacks of colloidal material added in small amounts daily in proportion to the rate of dilution.

Such an amount of mud would cost from $135 to $180. If the lack of a suitable mud causes a sticking of the pipe, the operator is forced to spend more than this amount to immediately condition the mud, and in addition has the expense of lost rig time and the cost of cutting out the stuck string. A minimum outlay of $750 can be expected and generally such troubles require a much greater expenditure than this.

NEWS from the Scrap Front

TIPS FROM OTHER "WASTE WARDENS" THAT MAY HELP YOU DO A BETTER JOB OF "GETTING IN THE SCRAP"

Courtesy Shell News

COUNTER BALANCE WEIGHTS SALVAGED—For years it's been common oil field practice to weight counter balances with old iron. One company declared this a waste of precious scrap, and is substituting stones in its counter balance boxes. This one source of scrap is expected to yield 300 tons! . . . *Are you urging your field employees to report scrap "finds" and to pick up smaller pieces on their regular rounds?*

OLD SUCKER RODS REPLACE NEW STEEL—Besides turning in about 1000 tons of scrap every month for conversion, an important oil company is saving steel by salvaging used materials for other purposes. For example, these junked sucker and pull rods are being used as reinforcing rods in concrete installations. . . . *Does your salvage program include the reclaiming or re-use of old equipment to obviate the need for new wartime purchases?*

WE "PRACTICE WHAT WE PREACH" — In one of many salvage operations, a U. S. Steel subsidiary recently dismantled several of its own mill buildings no longer suited to present steel-making practices. The yield was 3500 tons of structural scrap. . . . *Do you have any steel structures or equipment, idle now and of doubtful future value, which should be scrapped?*

THE SCRAP IS COMING IN . . . BUT NOT FAST ENOUGH!

WE have proof that industry is co-operating in the drive for scrap metals . . . proof measured in thousands of tons. But mills must get *more* iron and steel scrap if they are to meet the gigantic needs of war production.

Don't forget . . . steel gets to work on the battlefront more quickly when plenty of scrap is available. Scrap is already metallic. Therefore, less ore needs to be converted into pig iron per ton of steel produced. By re-melting scrap to make new steel, more tons of high-quality products can be turned out in a hurry for war purposes.

So make it your personal war assignment to see that your organization does a thorough, continuous job of "getting in the scrap." Cooperate with your local Industrial Salvage Committee.

SOME SCRAP ISN'T SCRAP

In the salvage yard of this western oil company old manifolds, headers and other fabricated pipe combinations are cut apart and brought to charging box size. This scrap material often contains short lengths of usable pipe and serviceable fittings, which are segregated and re-used. . . . *Can you cut up your heavy scrap to charging box size economically? It will bring a better price, and facilitate re-claiming usable material.*

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York* · CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago* · COLUMBIA STEEL COMPANY, *San Francisco* · NATIONAL TUBE COMPANY, *Pittsburgh* · TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*

UNITED STATES STEEL

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 44

OCTOBER 15, 1942

APPLICATION OF DATA FROM STEAM ENGINE INDICATORS

THE steam engine indicator is an instrument which records graphically, on an *indicator diagram*, the variations of pressure within an engine cylinder as the piston occupies different positions throughout its stroke. The indicator is nothing more than a form of recording pressure gage, the chart of which is moved at a speed that is proportional to the speed of the engine piston.

The engine indicator diagram furnishes a basis for: (1) calculating the indicated horsepower of the engine, (2) proper adjustment of steam intake and exhaust valves, (3) calculating the approximate amount of steam being used by an engine. In addition, indicator diagrams may reveal certain defects and troubles of an engine that would otherwise be difficult to diagnose. The most common use of indicator diagrams is in connection with the determination of the indicated horsepower of an engine.

Referring to Fig. 1, the indicator is connected to the cylinder in such a way that the pressure acting on the small piston (*A*) is the same as that in the engine cylinder. The upward movement of the indicator piston is opposed by the spring (*B*). The spring is compressed, and thus the piston is moved upward a distance proportional to the pressure acting against the lower side of the piston. The movement of the piston is communicated to a pencil (*C*) the point of which can be made to press against a paper chart placed around the drum (*D*). A cord (*E*) wound around the drum (*D*) is connected to the crosshead of the engine through a reducing mechanism so that the distance through which the drum oscillates is proportional to the stroke of the engine and hence proportional to the volume swept by the engine piston. At any instant, the height to which the pencil has been raised is a measure of the pressure at that instant within the engine cylinder, while the horizontal position of the pencil point on the paper chart denotes the position of the engine piston at that instant.

Since the most common use of an indicator diagram is in connection with determining the *mean effective pressure* in the cylinder of an engine, the method of making this determination will be discussed. By *effective pressure* at any given piston position is meant the difference between the two pressures which act upon a piston when it is traveling in opposite directions past that position. *Mean effective pressure* refers to the average of the effective pressure for a complete cycle of the piston, that is, for one complete revolution of the crankshaft as represented on an indicator diagram (Fig. 2).

It is necessary to know the scale of the indicator spring used in order to be able to calculate the mean effective pressure. For any particular indicator, springs are made of such strength that any given pressure acting upon the indictor piston will raise the pencil point a definite height on the diagram. Spring scales are denoted by specifying the pressure in pounds per square inch that must act on a standard-sized indicator piston working against the given spring in order to raise the pencil point 1 in. Thus, with a 100-lb. spring, each inch of vertical movement of the pencil point represents 100 lb. per sq. in. of pressure acting against the piston.

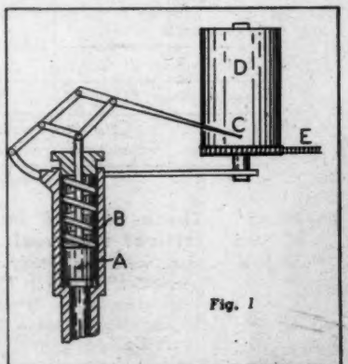

Fig. 1

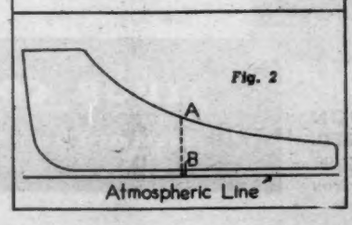

Fig. 2

A typical indicator diagram is shown in Fig. 2. The atmospheric pressure line shown on the diagram is taken with the cord attached to the engine crosshead but with a valve closed between the indicator and the engine cylinder so that only atmospheric pressure is acting against the indicator piston. The line furnishes a convenient means of measuring the length of the indicator diagram, since it is the same length as the horizontal distance between the extreme ends of the diagram. The atmospheric line is also used as a reference line from which to measure the pressure at any part of the stroke. Suppose, for example, that it was desired to determine the gage pressure acting against the piston at the midpoint of the power stroke as represented at *A*. The distance *A B*, perpendicular to the atmospheric line, in inches multiplied by the spring scale would give the pressure desired in pounds per square inch gage.

To measure the mean effective pressure accurately, the area of the indicator diagram must be determined. This is accomplished by using a planimeter. The average height of the diagram is then found by dividing the area by the length of the diagram. The average height of the diagram multiplied by the scale of the spring will give the mean effective pressure. If a planimeter is not available, the average ordinate method, which will be discussed later in this series, may be used for determining mean effective pressure.

Example

Problem.—The area of an indicator diagram is 2.15 sq. in. The length of the diagram is 3.00 in. The spring scale is 100 lb.

Calculate the mean effective pressure in the cylinder.

Solution.

$$\text{M.E.P.} = \frac{2.15}{3.00} \times 100 = 71.7 \text{ lb./sq. in.}$$

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

Specify Atmospheric Cooling Towers– Gain These War-Time Advantages!

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YOU MAKE THESE VITAL WAR-TIME SAVINGS FOR THE NATION

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Bearing this in mind, Fluor—manufacturers of *both* Mechanical Draft and Atmospheric Aerator Type Cooling Towers—directs the attention of industry to the fact that the war effort is best served by the specification of Atmospheric Cooling Towers because such specification immediately produces two important results. First, Atmospheric Cooling Towers release huge quantities of critical materials for armament production and, second, their specification greatly assists your production program because delivery is three times faster.

In 3 cases out of 4 where Mechanical Draft Types are being installed, an Atmospheric Cooling Tower will render identical service with identical thermal efficiencies. Therefore, in the interest of Victory, we believe the following rule should be strictly observed —*Atmospheric Cooling Towers should be specified in all instances except those where space or subnormal wind conditions make the use of Mechanical Draft Types imperative!*

ITEM	ATMOSPHERIC	MECHANICAL DRAFT	SAVINGS
DELIVERY	4 WEEKS	12 WEEKS	8 WEEKS
Critical Materials:			
1. Steel	None	33,600 lbs.	33,600 lbs.*
2. Fan Material	None	3,670 lbs.	3,670 lbs.*
3. Bakelite	None	250 lbs.	250 lbs.*
4. Brass	7,750 lbs.	10,650 lbs.	2,900 lbs.*
5. Cast Iron	19,550 lbs.	19,600 lbs.	50 lbs.*
Erection Man-hours	3300 Man-hours	5000 Man-hours	1700 Man-hours
Total Fan Horsepower	None	240 H. P.	240 H. P.*
Electric Motors	None	7 or more	7 or more*
Electric Switches	None	8 or more	8 or more*
Reduction Gears	None	7 or more	7 or more*
Electric Wiring	None	As required	100%*
Conduit	None	As required	100%*
Fans	None	7 or more	7 or more*
Flexible Couplings	None	14 or more	14 or more*
Fan Guards	None	7 or more	7 or more*
Fan Supports	None	7 or more	7 or more*
Steel Fan Rings	None	7 or more	7 or more*
Electric Power	Pumping	Pumping Plus Fans	50%

**Also saved are man and machine hours in producing raw materials, fabricating and assembling this equipment.*

These are the important critical material savings made when you specify an Atmospheric Cooling Tower. This parallel comparison is for an Atmospheric Cooling Tower and a Mechanical Draft Cooling Tower of identical capacity—10,000 g.p.m. Savings of badly needed critical materials, for larger or smaller Atmospheric Cooling Towers, are proportionate. Make the specification of an Atmospheric Cooling Tower your contribution to Victory. Be Sure With Fluor!

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Journalog

A FEATURE OF THE OIL AND GAS JOURNAL — No. 18

OCTOBER 15, 1942

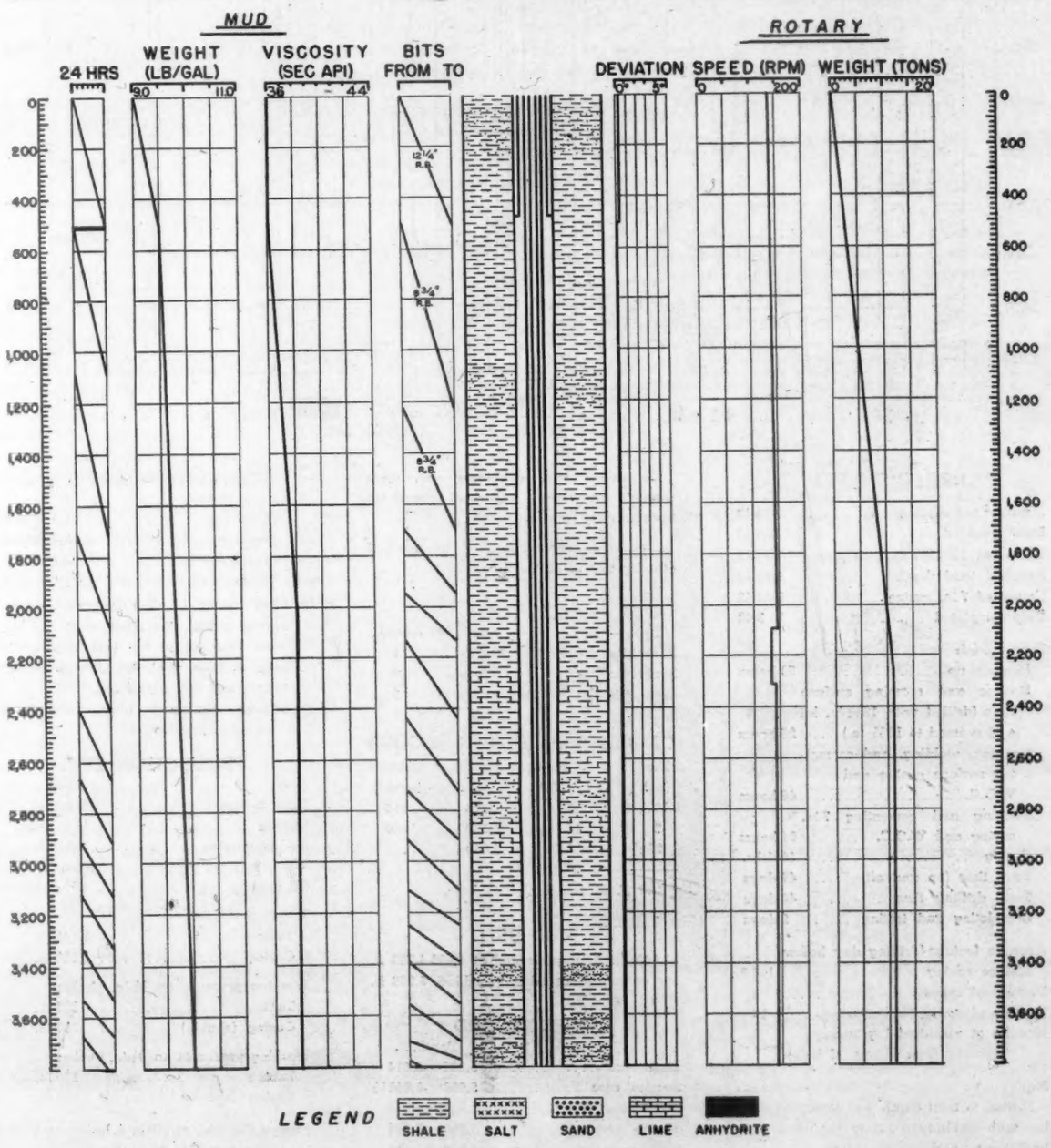
SUNRAY OIL CO. 1 WELCH

C NW SE 7-16n-2w
Elevation 1,023 ft.

CONTRACTOR

OLSON DRILLING CO.
OKLAHOMA CITY, OKLA.

Discovery Well of Guthrie Townsite Pool, Logan County, Oklahoma



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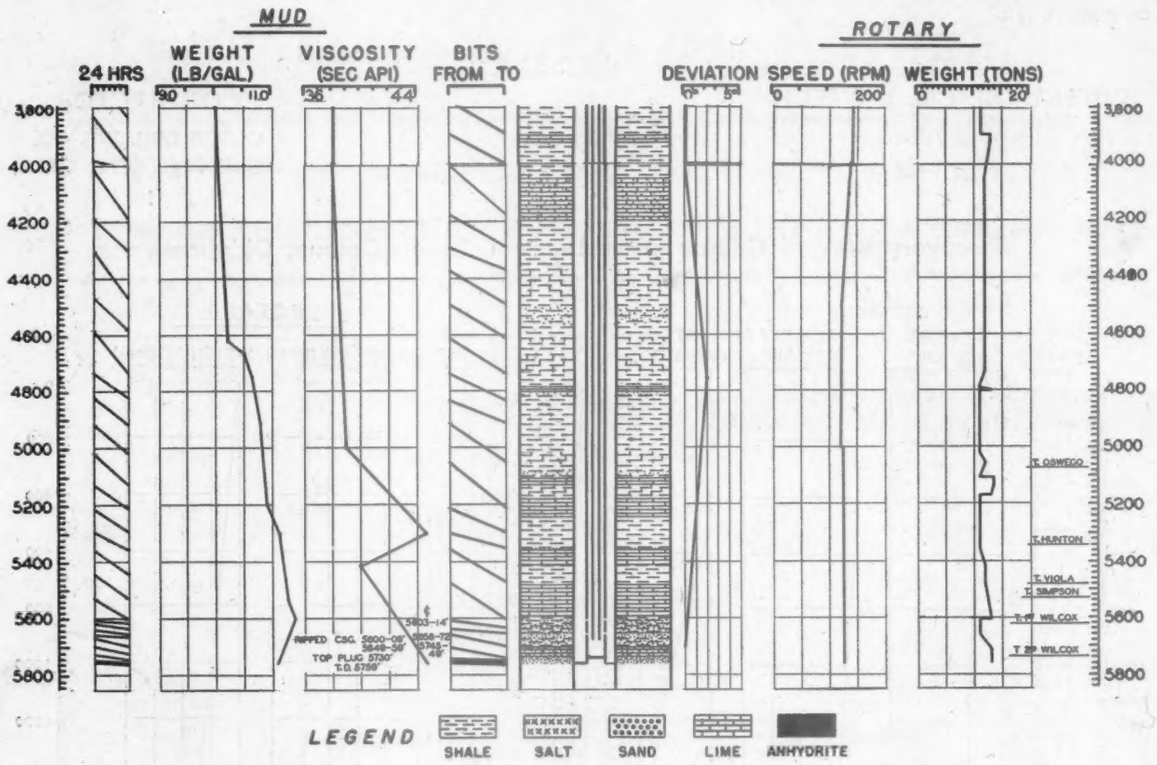
Journalog

Discovery Well of Guthrie Townsite Pool, Logan County, Oklahoma (Continued)



DRILLING DATA

Date started rigging up	7-18-42
Date spudded	7-20-42
Cemented 10¾-in. surface pipe	7-21-42
Reached total depth	8-29-42
Cemented 7-in. casing	8-30-42
Date completed	9- 3-42
Time record:	
Rigging up	30 hours
Drilling and reaming surface hole (drilled with 12¼-in. bit and reamed to 13¾ in.)	26 hours
Running, welding, and cementing surface casing and W.O.C.	48 hours
Running and cementing 7-in. casing and W.O.C.	64 hours
Coring	42¾ hr.
Total time (on and off)	47 days
Total drilling time	40 days
Completing and testing	2 days
Average footage/drilling day below surface casing	130.8
Number of cores	5
Number of straight-hole surveys	10
Number of electrical log surveys (Survey from bottom of hole)	1

Rig:

Drilled to total depth and cemented casing with gas-butane rotary rig using natural gas as fuel.

Completed with cable-tool unit (contractor's rig moved off—well completed by operating company).

Fuel and water furnished at nominal cost by city of Guthrie.

BITS USED

Type—	Size	Number
Rock bits	12¼-in.	1
Rock bits	8¾-in.	38
Core bits	6½ & 6¾-in.	5

CASING AND TUBING RECORD

Size (in.)	Weight (lb./ft.)	Depth (ft.)	Cement (sacks)
10¾	40	476	375
7	24	5,758	*400
2½	6.4	5,640	...

*29 ft. of cement left in hole.

MUD USED

22,800 lb. Aquagel added at 4,600-4,700 ft.
150 sacks cottonseed hulls added, 5,200 ft.

CORE RECORD

	Depth, ft.
First core	5,803 -5,814
Second core	5,836 -5,862½
Third core	5,862½-5,879
Fourth core	5,700 -5,704
Fifth core	5,745 -5,746

COMPLETION PROCEDURE

1. Casing ripped:
   - First cut ..... 5,649-56 ft.
   - Second cut ..... 5,606-09 ft.
   - Third cut ..... 5,803-08 ft.
   - Fourth cut ..... 5,600-03 ft.
2. Well started to blow in before cutting knives pulled. To close well quickly, knife line cut at top and allowed to drop in hole. Well killed with water; knives and line fished out.
3. Tubing run and hung, and well swabbed in.

PRODUCTION TEST

Date	9-2-42
Time flowed	24 hours
Chokes	¼ to ¾-in.
Oil production	366 bbl.
Water	none
Oil gravity	40° at 60° F.
Shut-in pressures:	
Tubing	1,100 lb.
Casing	1,050 lb.
Working pressure on ¼-in. choke:	
Tubing	325 lb.
Casing (shut-in)	750 lb.
Working pressures on ¾-in. choke:	
Tubing	170 lb.
Casing (shut-in)	500 lb.

Flowed 235 bbl. of oil in 4 hours on 9/16-in. choke with 630 lb. pressure.

REFINERY ACTIVITY AND EXPANSION

Refiners Instructed to File Price Lists With OPA Showing Actual Spot-Sale Revenue

WASHINGTON, D. C.—Refiners of petroleum and terminal operators handling petroleum were ordered October 9 to file with the Office of Price Administration in Washington lists of prices on spot sales in bulk between September 15 and October 14, inclusive, 1941.

Order 4, under Revised Price Schedule 88 (petroleum and petroleum products) requires the refiners and terminal operators to file the lists showing invoices for the spot sales in bulk of all petroleum and petroleum products, except aviation gasoline and asphalt. The lists must be filed within 30 days after receipt of notice to file by mail from OPA and must show actual prices at each shipping point where a sale was made.

Another order (No. 5) instructs refiners and operators of terminals to file lists of invoices on all domestic spot sales in bulk of aviation gasoline or less than 91 octane and of products used in such gasoline for the same period an all sales made at Gulf Coast points.

This information is urgently needed, OPA pointed out so that data may be obtained to permit compensatory adjustments for extra transportation costs in moving gasoline and other petroleum products to the eastern seaboard. These increased costs are paid by the Government through an arrangement worked out by the petroleum industry, the petroleum coordinator, the RFC and the OPA. Both orders are effective October 10.

●

Use of Petroleum Coke Limited By Conservation Order M-212

WASHINGTON, D. C.—Delivery and use of petroleum coke were restricted October 10 to certain essential war uses by Conservation Order M-212, issued by the director general for operations.

Petroleum coke, a solid residue from the destructive distillation of petroleum, is urgently needed for anodes in aluminum manufacture, for graphite and carbon electrodes, and in small quantities for other highly important products. Shortage of petroleum coke is caused by a decrease in cracking operations and by expansion of aluminum production and other phases of war produc-

Sketches of Plant Operators . . .

DR. ROBERT E. WILSON, president of Pan American Petroleum & Transport Co., has been selected to receive the Perkin Medal of the Society of Chemical Industry for 1943. This medal is awarded annually for outstanding work in applied chemistry and the medalist is selected by a committee representing the five chemical societies in the United States.

Dr. Wilson was born in Beaver Falls, Pa., and graduated from the College of Wooster, Ohio, in 1914. He then took 2 years of advanced work in chemical engineering at the Massachusetts Institute of Technology. He entered the government service at the outbreak of World War 1, advancing in rank to major in the chemical warfare branch.

In 1919 Dr. Wilson was called back to M.I.T. as director of the research laboratory of applied chemistry and was later made associate professor of chemical engineering.

In 1922 he became assistant director of research of the Standard Oil Co. (Indiana), where he did outstanding work in pioneering the application of chemical engineering principles in the oil industry. In 1929 he was placed in charge of the newly formed development and patent department of that company. In 1931 he became a director and in 1933 a vice president of the Standard of Indiana.

In January 1935, Dr. Wilson became vice chairman of the Pan American Petroleum & Transport Co. Under his supervision the company rapidly expanded its activities to a prominent position in all branches of the oil industry. Outstanding achievements have been made in the development of refining processes under his direction. Since February 1937 he has been president of Pan American, the American Oil Co., and other subsidiaries.

From June 1940 to August 1941 he served as chief petroleum consultant to the Advisory Commission of the Council of National Defense, and its successor, the Office of Production Management. Since then he has been a member of the Petroleum Industry War Council and chairman of the council's committee on petroleum economics.

In March 1942, at the request of the U. S. Treasury Department, he became one of four managing directors of the General Aniline & Film Corp., recently taken over from German ownership.

The medal will be presented on January 8, 1943, at a meeting to be held at the Chemists' Club, 52 East Forty-first Street, New York City.

MURRAY

Steam Turbines for

REFINERIES

Type "U" mechanical drive turbine. Casing split above shaft center line provides larger nozzle area, larger steam and exhaust sizes, and permits of more hand valves. All frames have exhaust center line support, stainless steel blading and nozzle, stellited cast steel governor valves and seats.

MURRAY IRON WORKS COMPANY

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THE OIL AND GAS JOURNAL

tion. Order M-212 provides that no person shall use, deliver, or accept delivery of petroleum coke except:

1. Where it is to be incorporated into any of the 30-odd products specifically listed in the order, including graphite and carbon electrodes, anodes for aluminum, magnesium and alloy steel manufacture. These permitted products are mostly electrical parts, silicon carbide abrasives, welding equipment and a few other classifications. The permitted items are vitally important, but with the exception of anodes for aluminum manufacture, they consume very small amounts of petroleum coke.

2. In the treating of metals where the coke is a reducing agent for treating metallic oxides when WPB makes specific authorization for this purpose. Instructions for applying for this permission are included in the order.

The principal uses of coke barred by this order are its uses in the manufacture of calcium carbide (important in make acetylene gas), as an industrial fuel, in heating homes, and other places where it competes with coal coke on a price basis.

Alien Custodian Seizing Enemy Copyrighted Works

WASHINGTON, D. C. — The Office of Alien Property Custodian is now regularly seizing copyrights of works of a scientific or technical nature that are owned by enemies. Many of these works are of great value to the war program, and the custodian is making them readily available to those who can use them.

Works of a scientific and technical nature, especially those written by German nationals, have often been available to libraries, scientific foundations and industrial groups in this country only at high cost.

Licenses for the reproduction of works seized by the custodian are being given to interested publishers or to others who desire to use the material with a view to securing wide dissemination of the works.

Some of the copyrights recently seized include those relating to Beilstein's "Handbook of Organic Chemistry," Peters' "Trigonometry Tables" and Fritz's "Luminescent Pigments."

Industry and OPC Consolidate California Plant Protection

LOS ANGELES, Calif.—Coordination and consolidation of antisabotage and protective work of the oil industry protection committee with the Facility Security Division of the Office of Petroleum Coordinator has been completed with the affiliation of two members of the committee with the coordinator's office, according to A. C. Rubel, chairman of the committee and vice president of the Union Oil Co.

"A. A. Jergins, vice chairman of the industry protection committee, has been appointed director at large of the division, and George F. Prussing, executive secretary of the committee, has been appointed director of the fifth district, comprising the western states. These two men will continue their affiliation with the oil industry protection committee as well, thereby insuring complete coordination of all protective activities within the industry," Mr. Rubel said.

Duty of the Facility Security Division of the OPC is to insure protection of all oil-industry facilities not specifically assigned to the Army. It is also aligned with the Office of Civilian Defense, whose broad responsibility is to insure proper precautions and protection for all facilities, both industrial and civilian, not specifically assigned to the Army.

Synthetic-Rubber Poly Plant Started at Akron

AKRON, Ohio.—A second government-sponsored synthetic-rubber polymerization plant is under construction at the Goodyear Tire & Rubber Co. facilities here and is scheduled for completion in November. The new plant will supplement another of the same capacity which was placed in operation in May. The two government-sponsored plants, each costing around $400,000, are in addition to a 2,500-ton polymerization unit built by the company prior to the war.

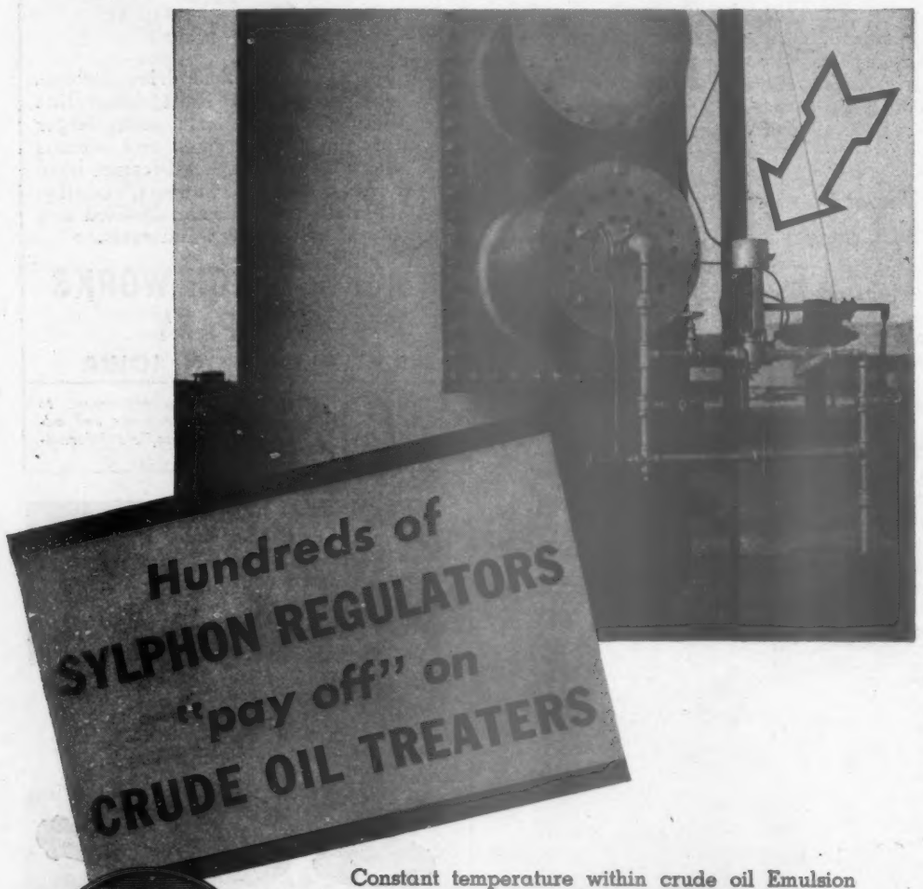
Procedure for Exporting Oil Equipment Changed by P-98-d

WASHINGTON, D. C.—Procedure for exporting oil-industry equipment is changed by WPB through issuance of P-98-d and revision of Priorities Regulation 9.

Export requests must now be filed with OPC on Form PD-311, and PD-1A may no longer be used. Exporters no longer need to file copies of export licenses with suppliers as a prescribed certification on PD-311 is sufficient.

No operator shall apply any preference rating to the delivery of material for any operation to which a preference rating may be assigned upon Form PD-311 or any form in the PD-311 series, unless the preference rating is actually assigned by such a form, or has been assigned by such a form and rerated pursuant to Priorities Regulation 12, as amended from time to time.

Preference ratings may be requested on Form PD-311 or Form PD-311-c until November 1, 1942, for material required in the fourth calendar quarter of 1942.



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The All-Navy "E" award for production.

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Representatives in All Principal Cities in U. S. A. and in Montreal, Canada and London, England

Pipe-Line Activity

Work Progresses in Laying Lima-Sparta, Ohio, Loops

The laying of 152 miles of 8-in. loops along the Illinois Pipe Line between Lima and Sparta, Ohio, is more than two-thirds completed. The contractor, Sheehan Pipe Line Construction Co., has field office at Mansfield, Ohio, in charge of James H. Nolan, superintendent. This looping program is financed by Defense Plant Corp.

The Sheehan organization has recently contracted the laying of 15 miles of 8-in. in the Canton-Somerdale, Ohio, area for East Ohio Gas Co.

Sinclair Buys Continental's Southwest Texas System

Negotiations have been completed for purchase by Sinclair interests of crude-oil lines of Continental Pipe Line Co. in the Corpus Christi, Tex., area and of approximately 1,900,000 bbl. of crude oil from Southern Minerals Corp. Consideration involved is $2,833,000.

In the deal, Sinclair interests would acquire the Continental gathering system of 300 miles of 4, 5½, 6, and 8-in. line which connects 22 pools in the Corpus Christi area.

In addition to the crude it would acquire from Southern Minerals, Sinclair also would make additional crude contracts with the company.

Deliveries are to be made from the Stratton, Richard King, and Saxet fields. The price paid is $1.48 per barrel with an 11-cent premium and the oil is to be delivered over a 2-year period starting October 1. Continental's gathering system at present is tied in with approximately 20 fields in the Corpus Christi area. Sinclair is to purchase about 1,500 bbl. daily in the Corpus Christi area for the new line according to reports.

Sinclair also plans to lay an 8-in. line to carry oil from the gathering system of Continental in the East White Point field, San Patricio County, to the Sinclair Damon station, in the Damon Mound pool in Brazoria County, Texas, which in turn connects with an 8-in. line to Sinclair's Houston plant.

Bayou Pipe Line System to Be Completed in December

Construction of the Bayou Pipe Line System, part of the program to increase oil deliveries to the East Coast, is well under way and should be completed some time in December, it was announced last week by Petroleum Coordinator Harold L. Ickes.

Deputy Petroleum Coordinator Ralph K. Davies said that the 250-mile second-hand line will have a capacity of 60,000 bbl. a day and will carry petroleum products directly from Gulf Coast refineries to the Baton Rouge end of the Plantation Pipe Line Co. system.

Additional pumping stations are being installed on the Plantation line which will increase its capacity from 60,000 to 90,000 bbl. daily. Plans also are being made to extend the northern end of the Plantation line from Greensboro, N. C., to Richmond, Va.

Construction of the Bayou system and the northern extension of the Plantation line will: (1) continue to provide the southeastern states with 60,000 bbl. of petroleum products daily; and (2) bring 30,000 bbl. daily to Richmond, Va., for transshipment by barge up the Chesapeake Bay to more northern points.

The Bayou system will consist of two segments: a 62-mile 8-in. line with a capacity of 37,000 bbl. daily from the vicinity of Baytown to Beaumont, and a 182-mile 10-in. line with a 60,000 bbl.-a-day capacity from Beaumont to Baton Rouge. Right-of-way acquisition for the entire line is nearly complete.

The Bayou system was organized by six Texas companies in accordance with the petroleum coordinator's Recommendation 49. Plans for the line were submitted by the industry's pipe-line managing subcommittee and approved by OPC.

Companies owning stock in the Bayou system and representatives who signed contracts are:

Humble Pipe Line Co., O. Q. Lomax, vice president; Texas Pipe Line Co., R. B. McLaughlin, vice president; Shell Pipe Line Corp., T. E. Swigart, president; Pan American Pipe Line Co., E. R. Turner, vice president; Pure Transportation Co., Henry Hauseman, vice president; and Crown Central Pipe Line & Transportation Corp., H. S. Lane, president.

The six companies agreed that the Bayou system will comply with and observe such terms and conditions as to the operation and maintenance of the line and facilities as the petroleum coordinator may from time to time deem to be necessary for the prosecution of the war.

Estimated cost of the line will be about $7,500,000, of which only $840,000 will be expended for new materials. Construction, operation, and maintenance of the Bayou system will be handled on a cost basis by the Shell Pipe Line Corp.

Under terms of the contract, costs for construction, maintenance, and operation of the line will be charged to the two segments of the line and will be shared on a prorata basis as follows: Three-fourths of the general costs of the Bayou system will be charged to the Beaumont-Baton Rouge account, and one-fourth to the Baytown-Beaumont account. All costs attributable directly to either of the two segments will be charged to the account of that segment. Costs for each segment will be shared by each participating company in an amount equal to the transportation capacity owned by each company in the Bayou system. Baytown-Beaumont segment: Humble, 35.72 per cent; Shell, 32.14 per cent; Pan American, 23.21 per cent, and Crown Central, 8.93 per cent. Beaumont-Baton Rouge segment: Humble, 23.36 per cent; Texas, 23.36 per cent; Shell, 21.03 per cent; Pan American, 15.19 per cent; Pure, 11.22 per cent, and Crown Central, 5.84 per cent.

Pipe-Line Personalities . . . . . W. Alton Jones

W. ALTON JONES, president of War Emergency Pipelines, Inc., has one of the toughest administrative assignments in the entire oil-industry war program. He is applying the same astute executive ability to directing the affairs of the corporation's 24-in. pipe line from East Texas to Illinois that characterized his part in preliminary negotiations, culminating in allocation of the necessary steel and arrangement of the required financing with the Government.

Mr. Jones is president of Cities Service Co., New York, but in recent months has given liberally of his time to the complex problems of the petroleum industry in fulfilling its war assignments. He is general chairman of the OPC District 1 industry-functional committee and heads the coordinator's transportation setup in the same area. He is a member of the Petroleum Industry War Council executive committee and also heads that organization's standing committee on transportation.

He became president of Cities Service in January 1940, succeeding Henry L. Doherty. Mr. Jones, as his assignments in the war program suggest, is one of the country's best-informed men in the fields of transportation, industrial research and economics.

Mr. Jones joined the Cities Service organization after his graduation from Vanderbilt University, where he concentrated on the study of utility management and service. After serving for a time at Joplin, Mo., as treasurer of Empire District Electric Co., a Cities Service subsidiary, he was transferred to New York headquarters and assigned to assist Frank Fruecuff. He was elected to the company board in 1922, and in 1925 became chairman of the executive committee of Henry L. Doherty & Co. Two years later he was elected first vice president of the company.

PREVENT CORROSION On Your Pipe Line

For permanent protection against corrosion, use NO-OX-ID Coatings and NO-OX-IDized Wrappers. These combinations may be applied hot or cold, by hand, or by traveling or stationary machine. They have high dielectric strength, resist soil action, and chemically inhibit underfilm corrosion. Dearborn Chemical Company, Dept. K, 310 S. Michigan Ave., Chicago.

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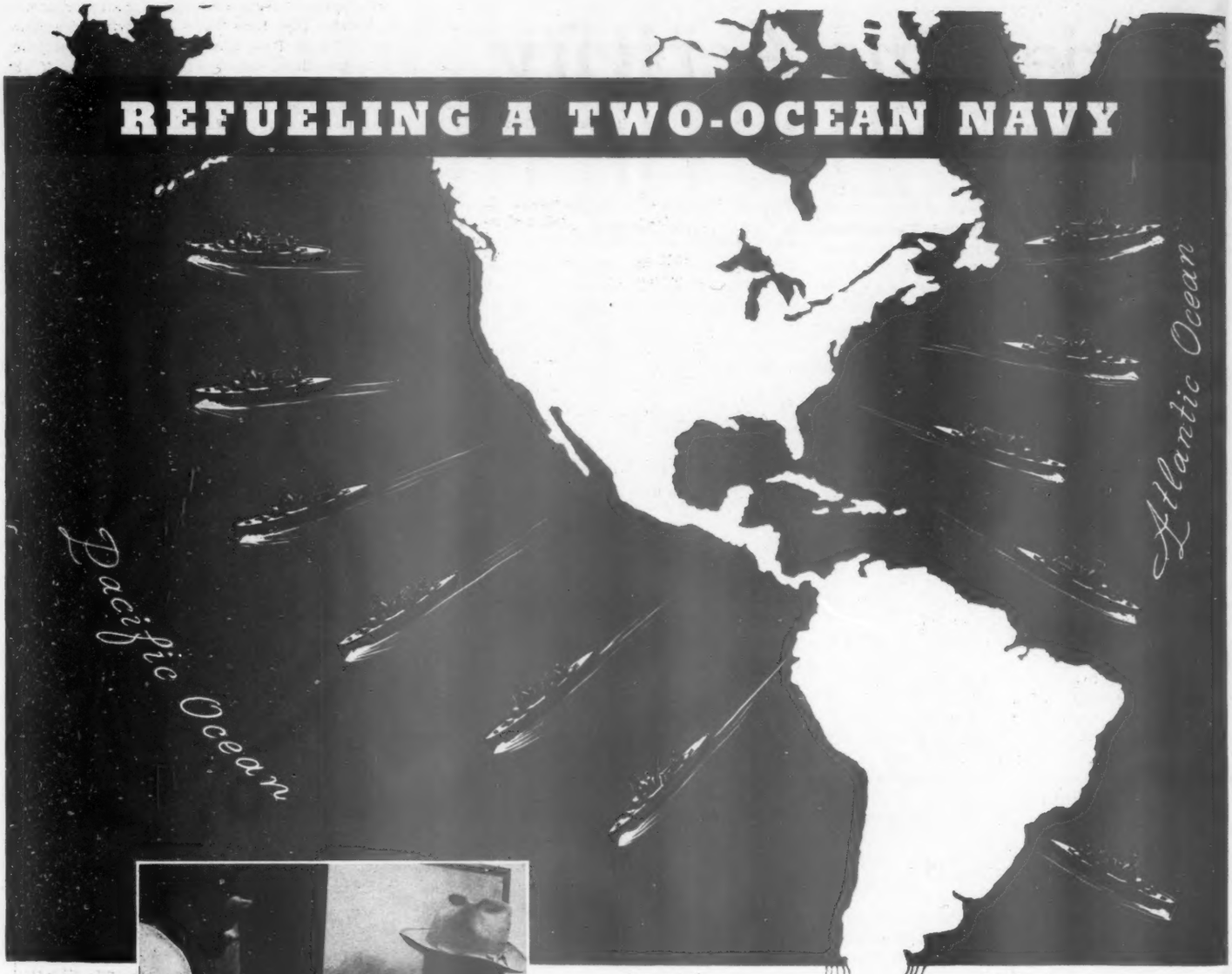
IT'S GOT *Swing!*

UNIBOLT "Flexi-Ball" Joint swings 45° to relieve rotary hose of strain.

UNIBOLT THE ONE BOLT COUPLING

THORNHILL-CRAVER COMPANY HOUSTON

REFUELING A TWO-OCEAN NAVY



Our Navy of the Future Being Built Today . . . Must be Powered by Future Oil Reserves Determined Today!

While American Industries and men work day and night to build our two-ocean Navy of the future, GENERAL GEOPHYSICAL crews throughout the United States, like other prospecting crews, are at work locating the future oil reserve to fuel and re-fuel those new war units.

The manner in which General's highly trained crews are assuming the responsibility of today's work is reflected in the thoroughness and accuracy of the reports being filed by these crews. These skilled men, equipped with modern equipment, are ready to aid you in planning your future drilling program . . . in planning it from accurate sub-surface data compiled by modern geophysicists.

General

GEOPHYSICAL COMPANY GGC **HOUSTON**

FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Oil men presenting testimony before the O'Mahoney committee are clearing up the point that a 20,000,000,000-bbl. reserve does not imply an inexhaustible store and also that 15 years' supply of oil in the ground does not mean that production could continue for 15 years without additional drilling. It is to be hoped that another misconception can be settled, namely that by opening up the wells production could be greatly increased. This is one of those statements which are dangerous because of their partial correctness.

During the early part of 1941 many people stated that increased production was possible for a short time but since that time production has risen more than 300,000 bbl. daily so that the statement may have been perfectly correct then and incorrect now. There are, however, two additional factors that have to be taken into account. Suppose valves were opened in the flush fields today and production was stepped up, say, 400,000 bbl. as a result. The valves would have to be closed tomorrow because bringing large quantities of oil to the surface in West Texas will not relieve any shortage on the Atlantic seaboard when it is impossible to get the present reduced output out of West Texas.

Another point which is of great importance is that reserve estimates presuppose a continuation of the production methods now in operation. It is plain that those areas in which production is unrestricted, wholly or partially, have a smaller reserve in terms of years' supply than those areas under proration. If Illinois is producing at the rate of 25 per cent of its recoverable reserves today, West Texas might be able to do the same thing, provided the oil could be moved. As West Texas has approximately 32 years' supply based on last year's production, it might be assumed that West Texas could produce eight times as much oil as it does now. That assumption would be quite wrong. It is impossible to state the effect of increasing production in exact mathematical terms but we may assume that if production in West Texas were doubled, reserves might easily be cut in half because the waste of energy due to open flow would mean that much oil now recoverable would remain in the ground.

By adding water to the Woodbine sand, it is estimated that 500,000,000 bbl. have been added to the recoverable reserves of East Texas. Flowing the wells wide open would probably reduce remaining recoverable reserves by from 500,000,000 to 1,000,000,000 bbl.

The proof for this contention lies in actual recovery figures from old fields produced on the get-it-fast principle. Recovery of 35 per cent of the total oil was considered very efficient in those fields. Under modern conditions, 50 per cent recovery is low. Opening valves would bring the nation to an acute shortage in a short time.

CALIFORNIA: A satisfactory water shutoff has been obtained at a north outpost to the Paloma field and preparations are under way to test the well (p. 72).

EAST TEXAS: A key wildcat on the Smackover lime trend along the Balcones fault system in northeastern Texas has been abandoned as a dry hole. A small flowing well in Smith County has extended Pettit lime production 2 miles south in the big Chappel Hill field (p. 79).

OKLAHOMA: Three wells were completed in the Centerpoint pool of Pottawatomie County to extend the pool ¼ mile north, east and south. The wells were completed in the Earlsboro sand, and have opened that horizon to production for the first time at Centerpoint (p. 76).

PERMIAN BASIN: The staking of a deep wildcat in southern Pecos County indicates the increasing interest of operators in the southern portion of the Delaware basin. A test in northeastern Ward County is showing for a gas well and Skelly Oil Co.'s mystery Ordovician wildcat in Crane County is shut down with shows reported near the top of the Simpson (p. 78).

NORTH CENTRAL TEXAS: Wildcats in Wise and Montague counties in the Fort Worth basin have encountered shows of oil and gas and both are flowing large amounts of oil, gas and mud. The Wise County wildcat, if successfully completed, will open first oil production in that county (p. 82).

NORTH LOUISIANA: A Winn Parish wildcat has opened another field on the middle Wilcox trend extending through South Central Louisiana. The test is flowing wet gas. A test in Bossier Parish has encountered a strong show of oil in the Pettit lime and promises to open a new field (p. 84).

MICHIGAN: Prospects for further development in the northern part of the Reed City field have brightened with the completion of a large well in that area. Several deep wildcats in the state have been completed as dry holes (p. 68).

LOUISIANA GULF COAST: A new field has been opened in the Branch area of Acadia Parish. The discovery well blew out and caught fire but continues to make considerable oil as fire fighters attempt to bring it under control. A new salt dome field is in prospect on the Bully Camp prospect, La Fourche Parish (p. 79).

ILLINOIS: A new shallow Biehl sand pool has been opened northwest of Mount Carmel in Wabash County, and the Devonian test in the Boulder pool of Clinton County continues to flow a large amount of oil with tools still in the hole (p. 66).

WYOMING: The discovery of a new field on the Horse Creek structure of Laramie County is rumored. The discovery well is reported to have encountered shows of oil near the top of the Dakota sand (p. 74).

OHIO: A Clinton sand gas pool has been opened in Coshocton County and a well in Muskingum County is showing for a good opener (p. 81).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended October 10, 1942)

	Oil	Gas	Dry	Total	Footage	Tll. comp. to date 1942	Tll. comp. to date 1941
N. Y., Pa., and W. Va.	39	25	3	67	143,113	2,739	4,606
Ohio	9	8	12	29	72,372	899	1,309
Indiana	3	2	8	13	21,259	282	394
Kentucky	0	1	0	1	1,289	216	527
Illinois	27	0	16	43	104,365	1,413	2,820
Michigan	5	1	7	13	38,994	567	690
Kansas	24	1	6	31	100,775	1,253	1,719
Nebraska	0	0	0	0	0	30	72
Missouri, Iowa	0	0	1	1	2,427	11	30
Oklahoma	9	1	13	23	87,922	956	1,490
Texas:							
North Central Texas	3	0	2	5	9,393	907	2,235
West Texas	13	0	10	23	73,455	1,099	1,759
Texas Panhandle	3	0	0	3	9,214	300	520
Eastern Texas	7	0	3	10	67,926	321	840
Texas Gulf Coast	2	0	1	3	14,655	566	848
Southwest Texas	5	1	6	12	38,529	855	1,454
Total Texas	33	1	22	56	213,172	4,048	7,656
North Louisiana	5	3	7	15	70,700	391	587
Louisiana Gulf Coast	4	1	0	5	50,729	405	681
Total Louisiana	9	4	7	20	131,429	796	1,268
Arkansas	0	0	0	0	0	138	144
Mississippi and Southeast	0	0	0	0	0	61	206
Montana	4	0	1	5	12,550	161	221
Wyoming	4	0	0	4	12,996	85	149
Colorado, Utah	0	0	0	0	0	17	25
New Mexico	5	0	0	5	20,528	214	220
California	12	0	0	12	37,802	578	879
Total United States	183	44	96	323	1,000,993	14,464	23,898
Total previous week	172	33	120	325			
Week ended Oct. 11, 1941	439	62	126	627			

Gas Storage Project Started in Playa Del Rey Field

By L. P. STOCKMAN

LOS ANGELES, Calif.—Storage of surplus gas originating in other California fields is being started in the Playa Del Rey field of Los Angeles Basin. Southern California Gas Co. is laying a 12-in. lateral into the field. The possibilities of using the Playa Del field for gas storage have been thoroughly investigated by engineers of the California State Railroad Commission and the Department of Natural Resources and the present plan is the outgrowth of an investigation into the supply and utilization of natural gas in California instituted by these state agencies in March 1941. The present plan contemplates injection of natural gas into the Playa Del Rey field during the summer season and during periods of low demand and the withdrawal of stored gas during the winter period or during times when peak demand for gas arises. Production of crude oil as a result of this gas injection and withdrawal is incidental as the demand for natural gas will be the dominating influence in operation of the reservoir.

Representatives of the two state agencies went to Washington a few weeks ago and laid the matter before OPC. The Defense Plants Corp. agreed to acquire necessary properties and equipment in the name of the U. S. Government. Prompt action followed. On Monday, September 28, the properties involved were posted by the DPC and formal possession was taken September 29. Considerable detail remains to be ironed out and the exact procedure to be followed by DPC in reimbursing operators and property owners will determine how the problem is to be handled. A total of 35 wells is involved but in addition there are certain interests accruing to the fee title of properties not now containing producing wells but which are located within boundaries of the productive area. The oil reservoir underlying the properties involved has been leased to the Southern California Gas Co. for storage purposes and Union Oil Co., principal operator in the field, was named by the DPC as agent to operate the property.

Southern California Gas Co. will start actual injection of natural gas into the reservoir within the next few days as it is estimated the 12-in. lateral now nearing completion will permit a starting injection pressure of about 175 lb. as it comes off a main distributing line into the district. Meanwhile, the company will dismantle a part of its compressor facilities in the Mountain View field in Kern County and move enough compressors into Del Rey to develop approximately 1,800 hp. Under 1,000-lb. injection pressure it is estimated the reservoir will permit the storage of about 3,000,000,000 cu. ft. of gas. Gas injection direct from the gas line will probably start in wells 5, 9, 10, 13, and 15 on the Vidor property. This group of wells has been selected because they are near the center of the acreage involved and because they have pressures low enough to take gas under line pressure pending installation of compressors.

The section selected for gas storage is the so-called Del Rey Hills area in the Playa Del Rey field which comprises the productive acreage in the extreme eastern end of the area. Involved in the storage plan are 3 wells on the Del Rey lease, 16 on Union Oil Co.'s Vidor lease, and 18 others located high up on the hill and owned by various operators. The Playa Del Rey field is located about 10 miles west of the center of metropolitan Los Angeles between the towns of Venice and Playa Del Rey and immediately adjacent to tidewater.

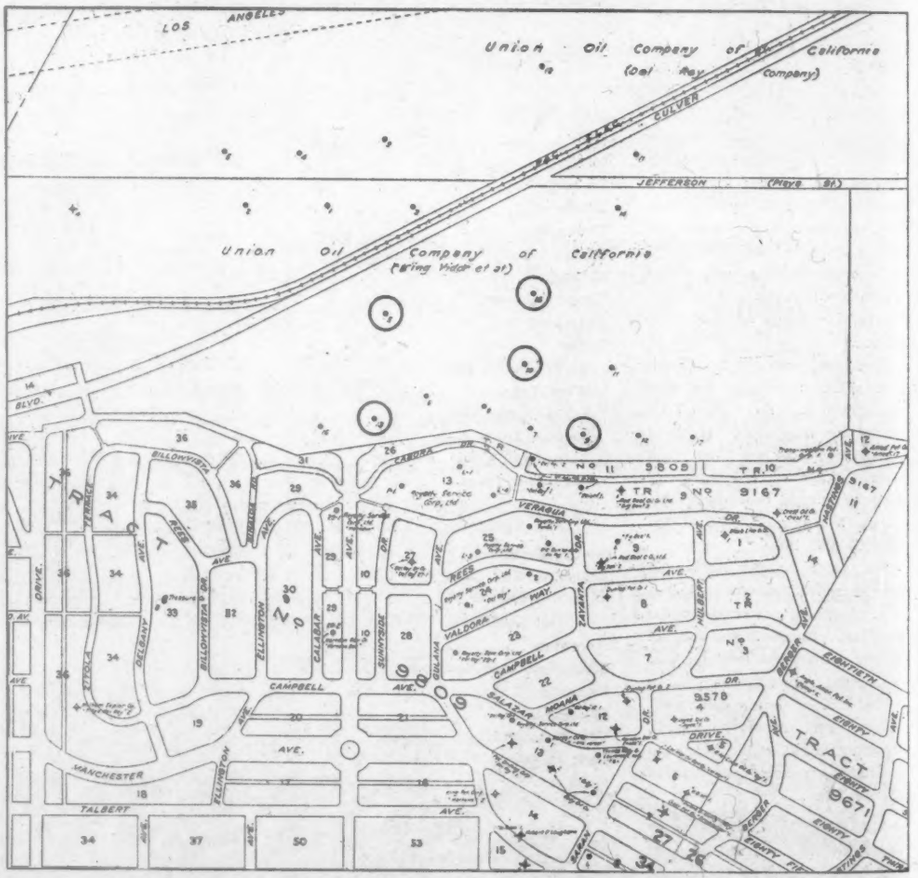
Production in the Del Rey Hills area is from but one zone which is correlative with the lower part in the original section of the field and consists of coarse sand, pebbles, and schist-bearing clastics deposited against a buried schist ridge. The Del Rey Hills section is divided from the rest of the Playa Del Rey field by a schist ridge that forms a barrier between the two areas. In some sections of the Playa Del Rey field an oil sand-conglomerate is the productive measure but in the Del Rey Hills area this conglomerate gives way to a more normal oil sand.

The Del Rey Hills area consists of a series of highs and lows varying in elevation from 125 to 175 ft. The Vidor lease and the area to the north and west is only a few feet above sea level and drainage is toward Ballona Creek which empties into the Pacific Ocean. There were at one time about 75 oil wells and dry holes in the Del Rey Hills section of the Playa Del Rey field but only 35 now remain on production.

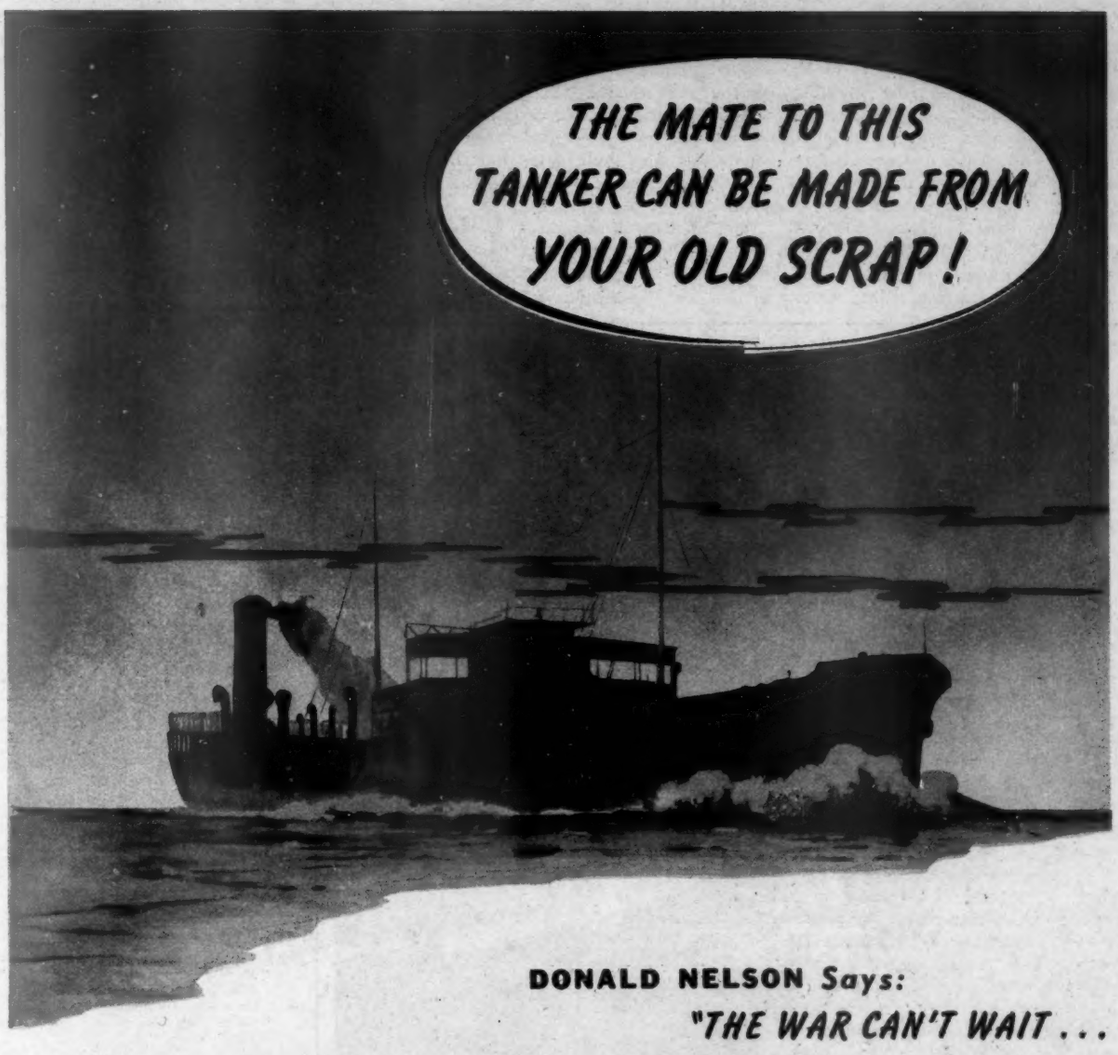
The use of the Del Rey Hills section of the Playa Del Rey field as a gas-storage reservoir for injection and withdrawal of natural gas as occasion demands should prove of much economic value to southern California consumers as it will furnish a means of balancing supply and demand for natural gas. Unfortunately there are no flush fields in Los Angeles Basin undergoing rapid development at the present time and for this reason all gas stored must come from San Joaquin Valley fields or from some of the productive fields in the coastal district. Playa Del Rey will not represent the first subsurface gas reservoir storage in California although it is the first oil field in the state to be so used. It will also be the first structure to be used with a multiplicity of ownerships and the first time that the DPC has stepped in as an operating agent.

Several years ago, the Pacific Lighting Corp. purchased all the productive acreage in the Goleta gas field in Santa Barbara County and converted this gas field into a gas-storage reservoir such as will be done in the Playa Del Rey field. After purchasing all acreage at Goleta, Pacific Lighting Corp. prepared existing wells for reception of surplus gas during periods of low demand and for withdrawal during high consumption.

When the state Railroad Commission and the Department of Natural Resources started out last year to make a minute survey they had in mind several factors one of which was to preserve the greatest benefits for the general consuming public. Among the factors considered were: (1) The occurrence and geographical location of present and possible future gas reserves; the availability of reserves; relationships between reserves of dry gas and casinghead gas and their most efficient use; (2) the possibility of utilizing underground storage as equalizing reservoirs between summer and winter demands, thus better protecting the supply for the basic domestic and commercial gas user and having in mind the incidental affect on the recovery of oil; (3) the adequacy of means of transmission and distribution of natural gas from fields to major markets: (4) formulation of marketing policies and plans of procedure from source to ultimate consumer to insure the highest degree of utilization of California's natural-gas resources.



Map of Playa Del Rey field. Gas will probably be first injected in wells shown in circles due to location in field and low pressures of the wells



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HOUSTON, TEXAS

ILLINOIS FIELD REPORT

Shallow Biehl Sand Pool Opened Northwest of Mount Carmel

MATTOON, Ill.—A new shallow Biehl sand pool was opened last week northwest of Mount Carmel in Wabash County when the W. E. Bailor 1 Robert R. Liddle bailed free oil after plug was drilled. The 1 Liddle, located in NE NE SE 27-1n-13w, encountered saturation in the sand section at 1,768-82 ft. and casing was set. At last reports the well was producing at the rate of 3 bbl. an hour and had not yet been cleaned out.

Meanwhile, E. Frank Jones 2 Harrison, SE NW 2-2n-2w, the second well to find the Devonian pay in the Boulder pool of Clinton County, was still producing with a string of 3⅞-in. cable tools lodged inside the 4-in. casing. Operators announced that the well will continue to be produced under these conditions until sufficient head has gone off the well to permit the removal of the tools with less hazard. At week's end, the well was flowing at the rate of 670 bbl. of oil daily.

Large Producer Completed In Dale Field

The completion of a big Aux Vases producer in the Dale field by Shell Oil Co., Inc., overshadowed other Hamilton County developments during the past week including the completion of another good well in the new Blairsville pool and the starting of two new tests in the same pool.

The Shell well was the 1 Webb, NW NE SW 18-6s-7e, which flowed 1,028 bbl. of oil and no water in an initial 24-hour test and was completed in the Aux Vases sand at 3,101 ft.

In the Blairsville pool, Texas Co. 1 Ernst, E½ NW NW 21-4s-7e, flowed 228 bbl. of oil in 24 hours and was completed in the Aux Vases sand at 3,263 ft. Another well in the pool which is showing for an excellent producer is the Magnolia Petroleum Co. 1 G. Travis, E½ NW SE 20-4s-7e, which pumped at the rate of 580 bbl. of oil daily from the Aux Vases at 3,271-3,301 ft. In addition, four other tests are drilling in the field, two are rigging up and location has been staked for another.

White County, which led all other Illinois counties in drilling during the greater part of 1941, is again forging to the front under new liberalized spacing rules. Last week, 12 first reports were listed for the county, and total operations had risen to 44.

ILLINOIS COMPLETIONS

Wildcats

Adams County: A. L. Williams 1 Pieper, SW NW NW 35-1s-6w, dry at 987 ft., Devonian 638 ft.

Edwards County: Jabionski 1 Bristow, NW SE NW 30-1n-11e, dry at 3,310 ft., Weiler 2,900 ft., Aux Vases 3,180 ft.

Effingham County: Papoose 1 Yirst, NW NE SW 12-6n-4e, dry at 2,454 ft., McClosky 2,378 ft., St. Louis 2,454 ft.

A. H. Gibson 1 Brummer, NE SW 2-6n-5e, dry at 2,521 ft., Benoist 2,290 ft., Aux Vases 2,420 ft.

Jasper County: Pure 1 Armistead, NW NW 20-6n-10e, flowed 1,065 bbl., natural, McClosky 2,855-68 ft., T.D. 2,880 ft., *extends North Boos ½ mile south.*

Jefferson County: R. Finn et al 1 Hawkins, NE SW NW 5-1s-3e, dry at 2,598 ft., Aux Vases 2,445 ft., Rosiclare 2,490 ft., Fredonia 2,528 ft.

Magnolia 1 Johnson, N½ NE SE 1-3s-4e, dry at 3,192 ft., McClosky 3,087 ft.

Lawrence County: Joe Baner 1 Arkansas Trust, NW NE NW 24-3n-11w, dry at 1,843 ft., McClosky 1,837 ft.

Macoupin County: J. A. Hirsch 1 Brueggeman, NW 17-8n-8w, dry at 360 ft.

Marion County: Ohio 1 Jones, NE NE SE 21-4n-4e, dry at 2,460 ft., McClosky 2,357 ft.

Wiser Oil 1 Mohlaudt, NW NW NE 31-3n-2w, dry at 1,390 ft., Aux Vases 1,268 ft.

Cameron Bros. 1 Hill, SW SW NE 14-3n-1e, dry at 1,831 ft.

White County: Continental 1 Brown, NE NE SW 25-5s-10e, pumped 105 bbl., McClosky 3,022-26 ft., T.D. 3,107 ft., *pool opener.*

Fields

Allendale, Wabash County: Bailor et al 1 Hershey, NE NW 35-2n-12w, dry at 2,182 ft., McClosky 2,157 ft.

Benton, Franklin County: E. S. Adkins 6 McKemie, NW 30-6s-3e, pumped 100 bbl., Tar Springs sand 2,162 ft., T.D. 2,174 ft.

Coll, Wayne County: W. C. McBride 1 Gregory, NW NW NE 30-1s-5e, dry at 2,988 ft., Cypress 2,602 ft., Ste. Genevieve 2,944 ft.

Cordes, Washington County: H. Hubbard 1 Dennis, SW NW SE 14-3s-3w, pumped 10 bbl., Benoist 1,264-74 ft., T.D. 1,279 ft.

Dale, Hamilton County: Pure 2-A Phillips, SE NW NW 6-6s-7e, pumped 149 bbl., Aux Vases 2,995-3,017 ft., T.D. 3,020 ft.

Dix, Jefferson County: Carter 3 Colb, SE NW SW 10-1s-2e, pumped 10 bbl., Benoist 1,944-47 ft.

East Centerville, White County: Midstates Oil 1 Hansman, SW SW NW 8-4s-10e, dry at 3,262 ft., Benoist 2,968 ft., McClosky 3,242 ft.

Fairfield, Wayne County: Texas 1 Galligar, SE SE 2-2s-7e, pumped 104 bbl., Aux Vases 3,183 ft., McClosky 3,296 ft., T.D. 3,309 ft.

Geff, Wayne County: Ohio 1 Weaver, NE SW NW 13-1s-7e, pumped 97 bbl., Aux Vases 3,072-88 ft., T.D. 3,107 ft.

Irvington, Washington County: Magnolia 4 Kolling, SE SE NE 15-1s-1w, pumped 97 bbl., Benoist 1,523 ft., T.D. 1,539 ft.

Louden, Fayette County: Carter 12-D Larimore, NW SW 11-8n-3e, pumped 125 bbl., Devonian pay 3,127-31 ft., T.D. 3,131 ft.

Carter 3-D Holman, NE NE 10-8n-3e, pumped 109 bbl., Devonian pay 3,124-26 ft., T.D. 3,126 ft.

Carter 1 Lilly, SE SW SE 9-8n-3e, dry at 1,525 ft., Weiler 1,514 ft.

Carter 1 Rhedemeyer, NE SE NE 3-8n-3e, pumped 396 bbl., Benoist 1,602 ft., T.D. 1,640 ft.

Mount Carmel, Wabash County: Horton & Wiggins 2 Carson, SE SW SE 16-1s-12w, pumped 77 bbl., sand 1,976-87 ft., Benoist 2,101 ft., T.D. 2,325 ft., P.B. 1,991 ft.

Seaboard 3 Guisewitt, NE NE NW 21-1s-12w, pumped 94 bbl., Cypress 1,970-88 ft., T.D. 1,989 ft.

Mount Erie, Wayne County: Pure 1-B Blackburn, NE 2-1s-8e, flowed 450 bbl., McClosky 3,098 ft., T.D. 3,105 ft.

Pure 1 Shelton, S½ NW SE 35-1n-8e, flowed 465 bbl., McClosky 3,085-97 ft., T.D. 3,125 ft.

New Bellair, Crawford County: C. R. Croft 1 Netheney, S½ SE NE 19-8n-13w, pumped 8 bbl., pay 1,165-79 ft.

New Harmony, White County: Superior 40 Fitten, NE SW SW 14-4s-14w, pumped 347 bbl., sand 2,216-44 ft., T.D. 2,245 ft.

Noble, Richland County: Pure 31 Coen, NE SE 4-3n-9e, pumped 228 bbl., Weiler 2,590 ft., T.D. 2,640 ft.

Pure 29 Coen, SE NW 9-3n-9e, pumped 18 bbl., sand 2,598-2,605 ft., T.D. 2,650 ft.

(Continued on Page 70)

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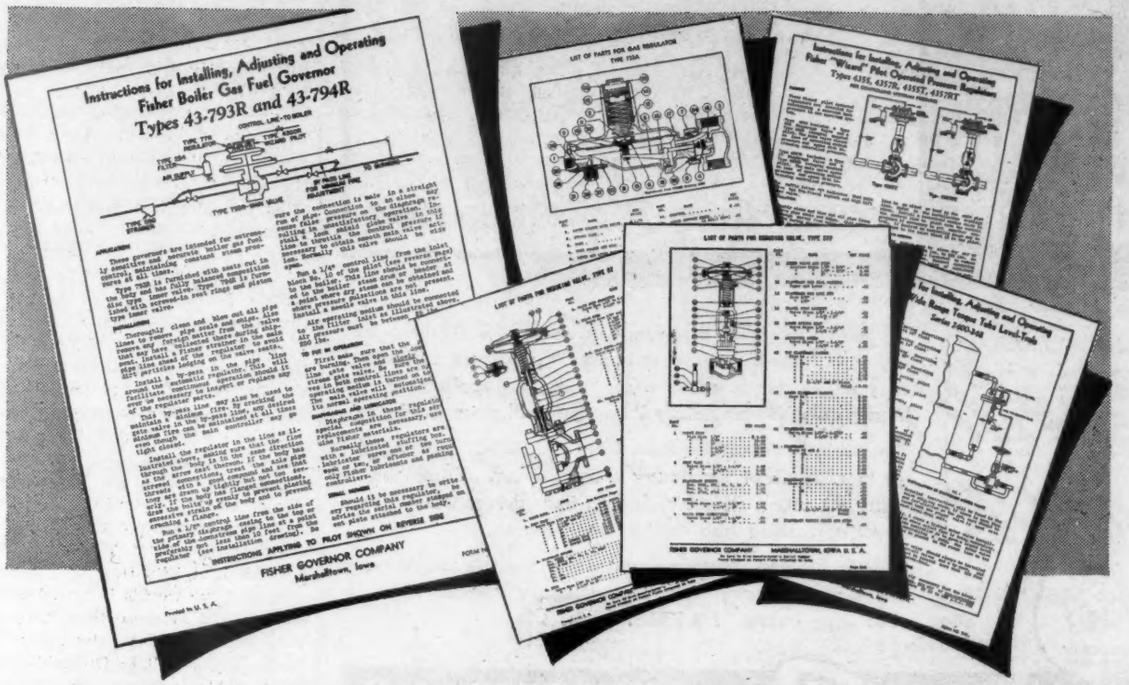
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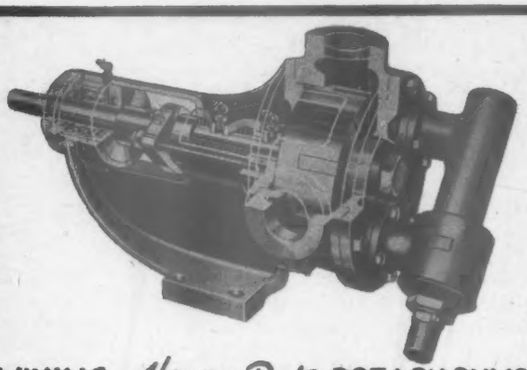

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MICHIGAN OPERATIONS

Northward Trend Indicated In Reed City Development

By OTTO C. PRESSPRICH

SAGINAW, Mich.—Prospects for further development in the northern part of the Reed City field were boosted last week as E. L. Bennight brought in 1 Howe in Section 20 of Lincoln Township, Osceola County, for initial production of 500 bbl. the first 10 hours after acid treating the hole at 3,559 ft. The well is on land that another operator had given up as unfavorable to development several months ago.

In Osceola's Marion Township, Gordon Oil Co. J-1 State, Section 17, was dry, one of several deep wildcat failures recorded during the week. The Gordon test was drilled to 4,067 ft., 12 ft. deeper than another unsuccessful test in Backus Township, Roscommon County, by American Drilling Co. In Summit of Mason County Charles W. Teater of Saginaw was unsuccessful with a test drilled to 4,085 ft. and his 1 Jewell wildcat in Troy, Newaygo County, also was dry. However, one wildcat test did get production as Sun Oil Co. completed 1 Camlin-Ellis, Section 10, Norwich Township, Missaukee County, for 32 bbl. a day, after acid treatment. The Camlin-Ellis was drilled to a depth of 4,457 ft.

Five of the week's 13 completions brought new oil potential of more than 1,400 bbl. a day. Six tests were dry holes, the other a small Taggart Brothers gas well in Riverside, Missaukee County. A 35-bbl. producer was completed in Trowbridge Township, Allegan County, and Gulf Refining Co. reported two more producers in Bay County's Kawkawlin field. In Decatur of Van Buren County Clapsaddle & Harris reported failure for a test acidized at 1,026 ft. after getting a fair showing of oil.

Operators were awaiting further activity at the Walter J. McClanahan 1 Milligan in Section 3 of Au Gres Township, Arenac County. Oil was reported up 600 ft. in the hole, drilled to below 4,100 ft. in the deep Monroe. The hole was shut down pending a decision relative to a water showing.

The state Conservation Department announced five more drilling permits, increasing the total for the year to 441, which is about 260 less than for this time last year. The permits are for tests in Allegan, Huron, Osceola, Calhoun and Ottawa counties.

Chartiers Oil Co., developer of the first producer in Gratiot County, last week spudded two offset locations. Drillers were plugging back from a water strata in Gordon Oil Co. 1 Blue, wildcat in Section 28 of Aetna Township, Missaukee County, where a good oil show was reported.

The Conservation Department will offer oil and gas lease rights at auction October 30 in Lansing on 24,500 acres of state land in Bay, Clare, Gladwin, Grand Traverse, Midland, Osceola, Oceana, Ogemaw, Roscommon and Wexford counties. Officials said that because of the state's location with respect to transportation to the eastern seaboard bids are due to improve. Last Friday at another lease auction an average of 55½ cents per acre was paid in bonuses on 15,098 acres. Summerfield Township, Clare County, attracted most attention, one 40-acre plot bringing $510. Operators already have 430,000 state-owned acres under lease.

MICHIGAN COMPLETIONS

Allegan County, Trowbridge Township: P. S. Anheuser 1 Tripp, NE SW SE 19-1n-13w, pumping 35 bbl. and salt water, acidized, T.D. 1,362 ft.

Bay County, Kawkawlin Township: Gulf Refining Co. 1 Moeller-Davidson, C S½ NE SW 34-15n-4e, pumping 75 bbl., acidized, T.D. 2,930 ft.

Gulf Refining Co. 1 Friebe-Knockel, C N½ NW

(Continued on Page 76)

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SOUTHWEST TEXAS

Deep Edwards Lime Discovery in Atascosa County Recompleted

By F. L. SINGLETON

CORPUS CHRISTI, Tex. — Humble 1 M. L. Thompson, which opened deep Edwards lime production in the Imogene area, Atascosa County, has been recompleted and is now on steady production although no gage has been made. After taking a potential test, in which the well flowed 123 bbl. of 38.7-gravity oil in 22 hours through a $\frac{4}{64}$-in. choke, the tubing pressure dropped to zero and the well stopped flowing. The hole was drilled deeper from a total depth of 7,573 ft. to 7,576 ft., and on a 10-minute drill-stem test at 7,573-76 ft., 500 ft. of oily mud and salty sulfur water was recovered. The hole was then plugged back to 7,550 ft. and drilled out to 7,572 ft., at which depth it is now producing. The recompletion indicates that only the top section of the lime will produce and position on structure will play an important part in the future trend of development. Rig from the discovery is being torn down and will be moved 1,800 ft. northeast where location has been made for 1 A. C. Soechting.

Magnolia 1 Buckner, the discovery well of deep Wilcox production in the Berclair area, Bee County, is still being tested and no official completion has been made. The latest test was made through perforated casing at 10,080-10,120 ft., and the well flowed 7 bbl. of distillate in 12 hours through a 9/64-in. choke. At the close of the week the crew was preparing to set a cement plug and the well is to be retested at an unknown depth. This discovery is significant inasmuch as it is the deepest Wilcox production developed along this particular sector of the Wilcox trend and the completion is expected to have much bearing on future exploration.

Second Producer at Poth Nearing Completion

Along this same trend, but located in the updip sector in Wilson County, the new Poth field had promise of its second producer with the showing of Superior Oil Corp. of Oklahoma 1 J. G. Gross. The first showing was logged in a core at 4,050-60 ft., with sand showing oil logged at intervals from 4,080-4,266 ft. The best sand section appears to be from 4,196-4,206 ft., where a 6-ft. saturated core was recovered. The outcome of this well will probably be delayed for several days while the crew fishes for drill stem which was twisted off at a depth of 4,314 ft. The well is located about 3,000 ft. southeast of the discovery well, completed earlier in the year in the Wilcox at 4,091-96 ft. However, the well was completed with difficulty due to mechanical trouble and no true picture of the producing sand was revealed. Although no geological tops are available, the extension well appears to be running structurally higher.

In Nueces County, and located 1½ miles northeast of Luby, Richardson Petroleum Co. apparently opened a new gas area with the completion of 2 Chapman, which is flowing at the estimated rate of 2,500,000 cu. ft. of gas daily through a ⅛-in. choke. Working pressure was 2,025 lb. Drilled to a total depth of 7,584 ft., casing was perforated at 5,967-74 ft. In view of its structural position in relation to the Luby field, it is possible that the well is associated with the same structure, although the area here is known to be very faulted.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Wildcats

Hidalgo County: Baldridge & King 1 Daskam, dry, T.D. 6,012 ft.

Baldridge & King 1 Yturria Town & Improvement Co., dry, T.D. 4,755 ft.

Fields

South Caesar, Bee County: Luling 1-C W. Slick, dry, T.D. 6,875 ft.

Stratton, Kleberg County: Chicago Corp. 45 Wardner, 181 bbl., ⅛-in. choke, perf. 6,577-83 ft., T.D. 6,616 ft.

Chicago Corp. 50 Wardner, 154 bbl., ⅛-in. choke, T.D. 6,640 ft.

Von Blucher, Jim Wells County: Shell 1 A. L. Jones, 2,710,000 cu. ft. gas, ¼-in. choke, T.D. 7,631 ft.

LAREDO DISTRICT

Fields

Colorado, Jim Hogg County: Humble 1 T. T. East, 126 bbl., $\frac{4}{64}$-in. choke, T.D. 3,106 ft.

Driscoll, Duval County: Continental 9-B Driscoll, 241 bbl., ¼-in. choke, perf. 2,650-58 ft., T.D. 2,994 ft.

Green Branch, McMullen County: Quintana 3-C South Texas Syndicate, dry, T.D. 5,894 ft.

Rincon, Starr County: Continental 63-H Slick, 216 bbl., 15/64-in. choke, perf. 3,950-70 ft., T.D. 4,258 ft.

Tarancahuas, Duval County: Plymouth 4-C Hoffman, dry, T.D. 3,042 ft.

SOUTH CENTRAL TEXAS

Wildcats

Dimmit County: Humble 1 Denton, dry, T.D. 8,010 ft.

Illinois Fields

(Continued from Page 66)

Pure 1 Hays, NE SE 22-4n-9e, pumped 16 bbl., Weller 2,582 ft., T.D. 3,015 ft.

North Boos, Jasper County: Pure 1 Resch, SE SW 17-6n-10e, pumped 99 bbl., McClosky 2,836-52 ft., T.D. 2,865 ft.

Parkersburg, Richland County: I. W. Siegal 1 Weisner, SE SW 17-2n-14w, pumped 140 bbl., McClosky 3,163 ft., T.D. 3,174 ft.

Phillipstown, White County: Jarvis & Marcell 2 Spencer, SE SW SW 31-4s-11e, pumped 462 bbl., sand 2,293-2,303 ft., T.D. 2,331 ft.

Roland, White County: Magnolia 7 General American Life, NE SW SW 1-7s-8e, pumped 76 bbl., Waltersburg sand 2,209 ft., T.D. 2,220 ft.

Carter 8 Hamilton, SW SE 2-7s-8e, pumped 56 bbl., Aux Vases sand 2,910 ft., T.D. 2,958 ft.

Carter 1 Blades, NW NE SE 15-7s-8e, dry at 2,545 ft., Waltersburg sand 2,164 ft., Glen Dean 2,369 ft., Golconda 2,476 ft.

Ste. Marie, Jasper County: Aetna Oil 1 Ochs, W½ NW NE 8-5n-14w, pumped 80 bbl., McClosky 2,827-34 ft., T.D. 2,876 ft.

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CALIFORNIA FIELD REPORT

Preparations Under Way to Test North Outpost of Paloma Field

By L. P. STOCKMAN

LOS ANGELES, Calif.—General Petroleum Corp. has secured a satisfactory water shutoff in 61-33 Gallagher at Paloma in Kern County and preparations are under way to make a production test in this important outpost within the next day or two. During the formation test, made to determine the status of the shutoff, the well showed a slight puff for about 10 seconds following the dropping of the pin late in the week. Recovery, with the valve open for 56 minutes, consisted of 4½ stands of muddy water, indicating a clean job. The crew immediately ran in a 5⅞-in. bit and cleaned out the hole from 11,005 ft. to 11,042 ft. This outpost, located far out on the north flank of the Paloma distillate field, is one of the most important wells being drilled in California at the present time as its completion would greatly increase the crude-oil reserve of the Paloma field, which is already considered one of the outstanding distillate fields in the country. Obviously if this well on the Gallagher lease of General Petroleum Corp. proves to be a dud it will not affect the field's present reserves as very few have estimated the northern limits of production would extend out to the Gallagher lease. Aside from its influence on possible future reserves of the field, the Gallagher outpost of General Petroleum Corp. at Paloma is interesting because core recoveries have indicated the presence of a black oil in contrast with the almost colorless distillate which is a light amber in color. It is important to note that core recoveries have not been any too satisfactory and for this reason the exact amount of oil sand present and freedom from possible contamination is more or less conjectural.

Deepening of Well Improbable

It is not likely any additional hole will be made at this time due to the possibility that mechanical trouble might develop from the fish that has been cemented in place after being sidetracked to 11,042 ft., which is 1 ft. above the original bottom. The shoe of the water string is at 11,000 ft. so that the Gallagher outpost will produce from 42 ft. of formation if no further footage is added. Completion of this well would greatly affect adjacent acreage as well as property located to the east and nearer the apex of the structure, but which up to date has not been tested. A completion, too, would make it necessary for some operators to begin drilling operations which would have to be started as there is enough acreage involved to permit the drilling of several additional wells on a 40-acre basis.

Several wells in settled fields kept several field crews on their respective toes during the past week or two. The first well to start the present parade of showy wells was Standard's 15-19-D fee, in the Midway-Sunset field of Kern County, which came in flowing 1,000 bbl. per day of clean oil from the depleted Lakeview zone of Pliocene age. A relatively small pumper, ranging from 75 to 150 bbl. per day, had been expected instead of a flowing well that yielded 451,000 cu. ft. of gas daily during the short time the well was permitted to produce. This week, Standard encountered a somewhat similar condition when 9 Sontag, in the old East Coalinga field of Fresno County, blew gas all during a 60-minute formation test and showed a recovery of 1,100 ft. of 30-gravity oil, 260 ft. of mud and oil, 170 ft. of muddy oil and 40 ft. of sand. This well, located in an old productive area, was bottomed at 4,032 ft., but was plugged back to 4,010 ft. prior to the formation test and had perforations open at 3,787-3,895 ft. and 3,938-4,010 ft. The strange part of this performance is the fact that 8 Sontag on the same property and in the same section, 36-19s-15e, was only good for 2 bbl. per day on the beam from the same correlative depth, 4,055 ft. Over in the old McKittrick field of Kern County, in which several operators have suddenly taken a keen interest, Union Oil Co., while making a formation test in 78-36 Westport fee, in 36-29s-21e, had the well blow out making gas and mud for 8 hours before it was killed. This formation test was being made of the interval 685-840 ft. and was from a gas sand that is generally in a depleted condition. Drilling operations have shown a substantial increase in the McKittrick field of Kern County, and if future developments justify we may expect a further gain in drilling especially in wells which have the shallow heavy crude-oil zone as their objective.

To cap an otherwise busy week, Texas Co. had two wells in the central part of the state begin unscheduled performances, but both were brought under immediate control. In the Tompkins Hill gas field, the company's 2 Holmes Eureka, in 22-3n-1w, tried to blow out from 5,200 ft. but was brought under control and after being killed the company landed a solid string of 3½-in. casing on bottom and will perforate opposite the gas sand and complete. This blank pipe method of completion has proved advantageous in several fields where it is necessary to sharp shoot for the productive sand due to its thinness or the presence of an intermediate water sand between two productive members. In the Tuscan Springs area of Tehama County 1 Walbridge of Texas Co. in 32-28n-2w flowed salt water and mud under a flow pressure of 115 lb. from the comparatively shallow depth of 1,033 ft. This high head flow is not surprising inasmuch as Tuscan Springs was at one time a fashionable watering resort and had several relatively large flowing wells containing salts and sulfur. The flow in this wildcat, which is being drilled in search of commercial gas production, was killed within a short time, but it is quite likely that Texas Co. may move location of the well, which was just getting under way.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge, South, Kern County: Belridge Oil Co., 78-33 fee, 33-28s-21e, pumped 58 bbl., 14.9-gravity, 10 per cent cut, T.D. 762 ft., 418-762 ft., completed in upper Belridge zone of Pliocene age.

Belridge Oil Co. 78-33-A fee, 33-28s-21e, pumped 95 bbl., 15.1-gravity, 20 per cent cut, T.D. 750 ft., perf. 403-750 ft., completed in upper Belridge zone of Pliocene age.

Ohio Oil Co. 3 Hopkins fee, 4-29s-21e, pumped 65 bbl., 15.1-gravity, 15 per cent cut, T.D. 849 ft., perf. 578-836 ft., completed in upper Belridge zone of Pliocene age.

Kern River, Kern County: Standard Oil Co. 1-8 fee Premier, 8-28s-27e, pumped 60 bbl., 13.9-gravity oil, 200 bbl. water, T.D. 2,900 ft., perf. 2,708-2,900 ft., M point 2,501 ft., N point 2,631 ft., Q point oil sand 2,708 ft., completed in Kern River series.

Standard Oil Co. 2-8 fee Premier, 8-28s-27e, pumped 45 bbl., 14.4-gravity oil and 200 bbl. water, T.D. 2,910 ft., perf. 2,678-2,910 ft., M point 2,488 ft., N point 2,600 ft., Q point oil sand 2,678 ft., comp. in Kern River series.

McKittrick, Kern County: Richfield Oil Corp. 1-A Belgian, 3-31s-22e, pumped 12 bbl., 15.5-gravity, 12 per cent cut, T.D. 1,098 ft., perf. 933-1,096 ft., completed in upper McKittrick zone of Pliocene age.

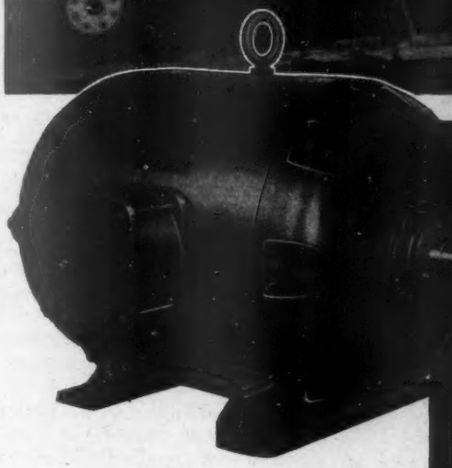
Midway-Sunset, Kern County: Standard Oil Co. 68-31-E fee, 31-12n-23e, pumped 60 bbl., 28.9-gravity, 0.4 per cent cut, T.D. 2,223 ft., perf. 2,196-2,221 ft., Scales 2,102 ft., Kinzie oil sand 2,762-2,823 ft., Pliocene age.

Riverdale, Fresno County: Amerada Petroleum Corp. 1 Brum, 15-17s-19e, flowed 410 bbl., 35.9-gravity, 0.4 per cent cut, 2,720,000 cu. ft. gas, 13/64-in. bean, flow pressure 650 lb., T.D. 6,840 ft., P.B. 6,780 ft., perf. 6,740-80 ft., McClure 5,248 ft., Temblor 5,524 ft., completed in Lawton zone of Miocene age after acidizing hole.

COASTAL DISTRICT

R. E. Havenstrite, whose 2 Barnes in the Del Valle field of Los Angeles County recently indicated a potential of 4,000 bbl. of 41-gravity oil per day from a new deep zone, has cored about 200 ft. of formation and accordingly will soon

Shipment of pumps on their way to join a host of other Wagner-motored pumps now in service in the oil industry. These pumps are all equipped with Wagner Explosion-Proof, Polyphase Motors.



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Give added safety to your plant investment, protect your production, and cut motor maintenance cost, by specifying Wagner type HP Explosion-Proof Motors.

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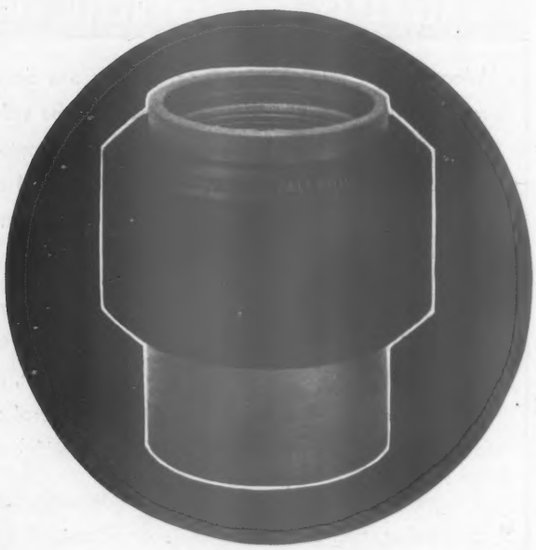
conduct a production test of the well, which will be finished in the conventional manner. Since the first test was made of 2 Barnes, Havenstrite has opened up an additional amount of oil sand in the new zone and now has about 200 ft. of oil sand and shale at 7,866-8,065 ft. This new zone appears to be a discovery of considerable importance and may affect the entire Newhall-Castaic region, which includes all fields in western Los Angeles County adjacent to the Ventura County line, because if it means a new unsuspected zone in several fields it will substantially increase productive possibilities in the area as a whole. This new zone at Del Valle may have a thickness of from 250 to 500 ft., but it is not likely that Havenstrite will open much additional hole before proceeding with completion work. This new zone now makes the Del Valle field look hot again after a year or so of unfavorable developments. In the San Martinez field, located west of Del Valle, Standard Oil Co. and Ohio Oil Co. should be able to determine the importance of the Pliocene oil sand found by Standard a few months ago as both operators have wells on top of the pay at the present time. This Pliocene accumulation appears rather limited in areal extent because it was not found previously in the Del Valle field to the east or in the original section of the San Martinez field to the west. It may lie between the present productive limits of the two fields in an area that appears to be rather badly broken up. The zone appeared to have too much kick to be only a very concentrated area.

Drilling operations are again increasing in the Santa Maria Valley field of Santa Barbara County due to operations of R. R. Bush Oil Co., Hancock Oil Co. and Union Oil Co., which still have numerous undrilled locations. It is not likely that any general drilling program will be started in this field due to the fact that pipe-line facilities will not take care of much additional production. In addition to this, the production committee for District 5 has instructed operators to save every possible cubic foot of natural gas and put it to good use pending the installation of facilities to remove sulfur from the gas. This field does not produce much natural gas as it has a low gas-oil ratio, but when several hundred wells are involved the cumulative effect results in a substantial production of gas. The Santa Maria Valley field has cooled off to some extent and has been supplanted by the Cat Canyon field, which from a statistical standpoint, is carried in reports along with Purisima and Lompoc as the Santa Maria field. West Cat Canyon field is the hot spot at present because it is yielding large flowing wells from the Miocene over a large expanse of acreage. Miocene production was first developed by Standard Oil Co. on the Los Flores property a few years ago but development to date has been retarded due to pipe-line facilities and other transportation facilities now tied up as a result of the war. Developments to date indicate Union Oil Co.

(Continued on Page 92)

Rodessa Operator uses Patterson-Ballagh Tubing Protectors in more than 50 wells



After trying out practically all makes of guides and tubing protectors, a prominent Rodessa operator has adopted Patterson-Ballagh Plastic Tubing Protectors. This operator tried some guides costing as much as $75.00. Concluded Patterson-Ballagh to be the best and cheapest. Standard practice of this operator is to install these Protectors whenever a collar shows wear, no matter how little. They are now used in more than 50 wells for this one company alone. In two years almost no Patterson-Ballagh Tubing Protectors have been replaced. When a collar is worn, it means the casing is worn too! Avoid this by installing—

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ROCKY MOUNTAIN AREA

Discovery on Horse Creek Structure Rumored

By T. R. INGRAM

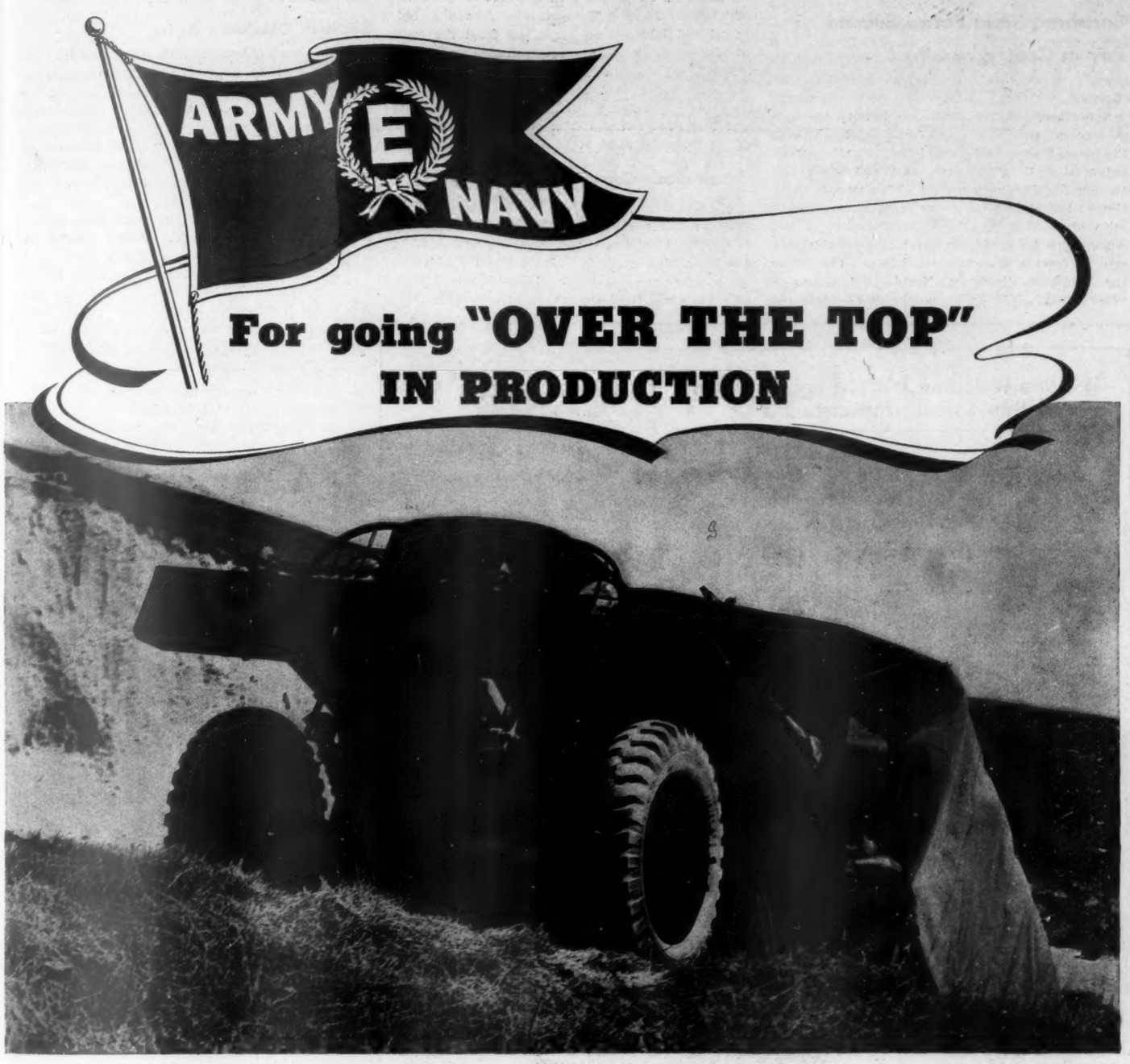
DENVER, Colo.—Wyoming and Colorado wildcatters were treated to an old-time thrill this week when rumors began to circulate to the effect that the General Petroleum Corp. had made a discovery on the Horse Creek structure, Laramie County, Wyoming, 20 miles northwest of Cheyenne in its 78-31-G, SW SE SE 31-17n-68w. The test, which spudded a little more than a month ago, is a "tight" well and no official information is available. Only drilling depths have been given out and the last report put it at 4,373 ft., total depth, and drilling ahead. Unofficial reports, which come from sources generally dependable, say that it reached the top of the Dakota at 5,264 ft., where shows of oil were encountered, and that the well was shut down to run casing and install control equipment. Oil men generally feel that a discovery is probable. The location is approximately 50 miles east of the Carbon County oil and gas fields and 100 miles south and a little west of Lance Creek. Amerada Petroleum Corp. drilled to 9,385 ft. in 1936 in its 1 Morton, 20 miles to the south and a little to the west.

The British-American Oil Producing Co. began two new operations in the Pilot Butte area the past week. One of these is in the NW NW SW 32-4n-1w, on the Steamboat Butte high, 4 miles northwest of the Tensleep discovery in the Pilot Butte field. The other is a Pilot Butte outpost ¾ miles north of the discovery in its 1-D Tribal, CWL SW NW 15-3n-1w. The trend of development is undergoing a change following a dry hole in the Tensleep and a small well in the Embar to the southwest and a large well to the northwest of the discovery.

A dry hole in the National Parks Oil Co. 1 Chatterton, SE SW NE 22-32n-6w, at the extreme south end of the Cut Bank field, indicates that it has found the edge of the productive area on the west side. It had a little water in the upper Cut Bank and a dry hole in the lower Cut Bank. It is approximately 2 miles west of a flock of good producers with only two intervening wells, both of them completed in the winter of 1936-37.

Hi-Gravity Oil Co. has made a location in the West Kevin district in Toole County, Montana,

(Continued on Page 80)



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On December 7, 1941, that occasion *did* arise—and today's swift flow of axles and other essential material from Timken plants to the far-flung battle lines is evidence that this cooperation was well directed.

The privilege of flying the coveted Army-Navy "E" above our plants—at Detroit, Michigan, at Waukegan, Illinois, and at Oshkosh, Wisconsin—rewards the past efforts of Timken men and women to "Keep 'Em Rolling." It inspires every one of us *now* to work for greater and yet greater production. It sends us to our individual jobs with new determination to outwork and out-produce the robots of Europe and Asia, until our Fighting Forces have all the fighting weapons needed to crush the foes of Freedom!

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OKLAHOMA FIELD REPORT

Earlsboro Sand Forms Second Pay in Centerpoint Pool

By CARL HOOT

IN northwestern Pottawatomie County the Centerpoint pool was one of the most active in the state. Three wells completed there last week extended it ¼ mile north, east and south. Although the discovery well, C. W. Sharp 1 Wells, flowed 223 bbl. of oil a day from Simpson dolomite at 5,630-50 ft., the three completions last week were in Earlsboro sand and considerably smaller from a production standpoint. Classed as the Earlsboro discovery, Norbla and Sunray 1 Wagner, SW SW 6-9n-3e, northeast offset to the 1 Wells, was drilled to 5,790 ft. but was plugged back and a drill-stem test at 4,911-75 ft. showed 5,000,000 cu. ft. of gas at a bottom-hole pressure of 2,100 lb. On later tests the well flowed 35 bbl. of oil and 1,300,000 cu. ft. of gas from the sand at 4,930-60 ft. The northwest extension was C. W. Sharp et al 1 Williams, which flowed 40 bbl. of oil a day from sand at 4,993-5,002 ft. The same interests' 1 Brundage, NE cor. 12-9n-2e, flowed 6,250,000 cu. ft. of gas with only a small amount of oil from the sand at 5,044-48 ft.

Pottawatomie County Wildcat Retested

About midway between the Brooksville and Hotulke fields, Mid-Continent Petroleum Co. retested its 1 Caldwell, a wildcat in NW SE NE 1-8n-3e, which early in July pumped 14 bbl. of oil a day from Hunton at 4,530-4,674 ft. Operators went into the hole again and squeezed perforations at that depth and reperforated from 4,830-50 ft. The well failed to show after an acid treatment and was given up as dry.

Southern Oklahoma Active

Approximately 1 mile south of the prolific Cumberland pool of Bryan and Marshall counties, Pure Oil Co.'s wildcat, 1 Stewart-113, SE NE NW 33-5s-7e, was dry at 6,323 ft. Both the McLish lime at 5,761 ft. and sand at 6,197 ft., on productive levels with the two producing zones in the Cumberland field, were dry. The well was also tested for sale water disposal but poor porosity prevented its use as such.

In Tillman County, along the Red River bed and on government land, Burke Divide 246 Guthrie, NE SE NE 8-5s-14w, had a show of oil in sand at 1,615 ft. but was dry at 2,185 ft. The same operators skidded the rig to 247 Guthrie, NE SE NE 8-5s-14w, and on last report were drilling in the Ellenburger formation at 2,496 ft. Sands topped at 1,575 ft. were tested but the results were not announced.

OKLAHOMA COMPLETIONS

Wildcats

Harmon County: Gulf 1 Chaffin, SW SW 25-1n-25w, dry, T.D. 7,523 ft., sand 5,370 ft., no shows.

Hughes County: Barnsdall 1 Mount, NE cor. 2-8n-8e, dry, T.D. 4,342 ft., Cromwell 3,424 ft., Hunton 4,071 ft., show oil, Viola 4,244 ft., Wilcox 4,296-4,309 ft., second Wilcox 4,332-42 ft.

Marshall County: Pure 1 Stewart-113, SE NE NW 33-5s-7e, dry, T.D. 6,323 ft., sand 5,470 ft., 5,570 ft., and 5,647 ft., McLish 5,761 ft., sand 6,197 ft.

Okfuskee County: Newt Barrett 1 Bean, NE cor. 19-11n-9e, dry, T.D. 3,430 ft., Cromwell 3,391 ft.

Oklahoma County: Sunray et al 1 Armstrong, SW SE NW 6-13n-1e, dry, T.D. 5,889 ft., Bartlesville 5,354 ft., Hunton 5,524 ft., Viola 5,682 ft., Wilcox 5,774 ft., second Wilcox 5,873 ft.

Pottawatomie County: Mid-Continent 1 Caldwell, NW SE NE 1-8n-3e, dry, T.D. 5,157 ft., squeezed perf. 4,530-4,674 ft., perf. 4,830-50 ft., acid, no shows, old well reworked.

Fields

Centerpoint, Pottawatomie County: C. W. Sharp et al 1 Williams, NE SE 1-9n-2e, flowed 40 bbl., Earlsboro 4,993-5,002 ft., T.D. 5,916 ft.

C. W. Sharp 1 Brundage, NE cor. 12-9n-2e, flowed 2 bbl. oil and 6,000,000 cu. ft. gas, Earlsboro 5,044-48 ft., T.D. 5,843 ft.

Crescent, Logan County: Davon 1 Gord, SW NE NW 27-17-4w, flowed 75 bbl., Layton 4,925-58 ft.

Cumberland, Marshall County: Pure 1 General American Life-112, SE NW SW 20-5s-7e, flowed 152 bbl. in 4 hr., sand 5,973 ft., T.D. 6,016 ft.

Dilworth, Kay County: Fred Morgan 1 Roach, NW SE 30-29n-1e, dry, T.D. 3,434 ft.

C. A. Leonard 2 Hitch, NE NW SW 19-28n-1e, pumped 54 bbl., sand 3,321-27 ft.

Isom Springs, Marshall County: E. L. Gill et al 5 Adams, NE SE NE 6-8s-6e, pumped 15 bbl., sand 498-505 ft.

Liberty, Noble County: Sunray 2 Schultz, NW SE SE 9-22n-2e, dry, T.D. 4,849 ft.

Velma, Stephens County: L. W. Winkler 1-A Brown, SE NE NE 3-2s-5w, dry, T.D. 2,685 ft.

Watchorn, East, Pawnee County: Alma Oil 1 Travers, SW NW SW 25-23n-3e, flowed 1,000 bbl. in 14 hr., Wilcox 3,971-82 ft.

(Continued on Page 82)

Michigan Fields

(Continued from Page 68)

NW Sec. 35 pumping 65 bbl., acidized, T.D. 2,932 ft.

Clinton County—Greenbush Township: Grale Oil Co. 1 Sommerville, NW SE NE 12-8n-2w, wildcat, dry, T.D. 3,641 ft.

Jackson County, Springport Township: Ashby Drilling Co. 1 Landon, C S½ SE SW 18-1s-3w, wildcat, dry, T.D. 2,515 ft.

Mason County, Summit Township: Charles W. Teater 1 Piper, C S½ SE SW 18-17n-17w, wildcat, dry, T.D. 4,085 ft.

Missaukee County, Norwich Township; Sun Oil Co. 1 Camlin-Ellis estate, C S½ SE SE 10-24n-5w, wildcat, 32 bbl., acidized; T.D. 4,457 ft.

Riverside Township: Taggart Brothers Co. 61 Hookwater et al, C SW 22-21n-7w, 1,100,000 cu. ft. natural gas, T.D. 1,390 ft.

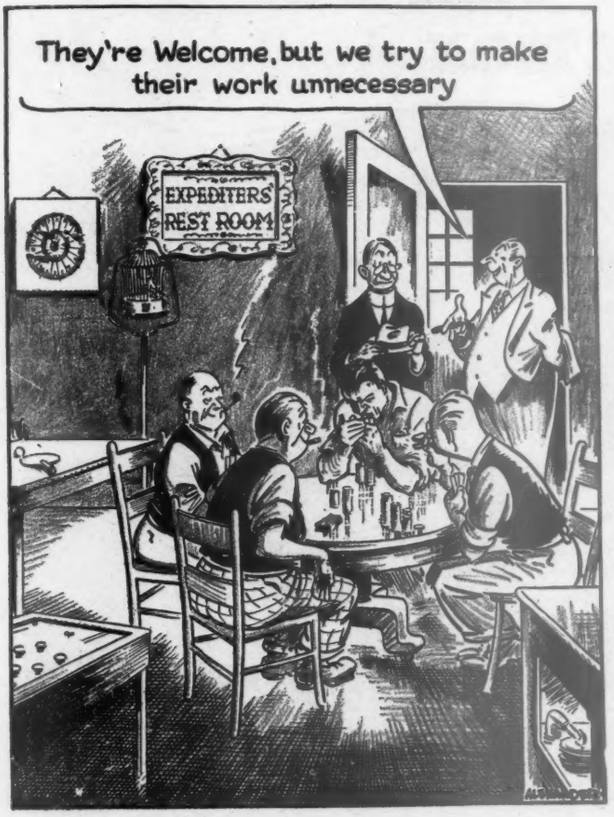
Newaygo County, Troy Township: Charles W. Teater 1 Jewell et al, W½ NE SE 24-16n-14w, wildcat, dry, T.D. 2,795 ft.

Osceola County, Lincoln Township: E. L. Bennight 1 Howe, S½ NW NE 20-18n-10w, 500 bbl., acidized, in first 10 hr., T.D. 3,559 ft.

Marion Township: Gordon Oil Co. J-1 State, C NW NE 17-20n-7w, wildcat, dry, T.D. 4,067 ft.

Roscommon County, Backus Township: American Drilling Co. V-1 State, N½ NW NW 22-22n-2w, wildcat, dry, T.D. 4,055 ft.

Van Buren County, Decatur Township: Clapsaddle & Harris 1 Johnson & Lyle, communitized, C W½ NW NW 4-4s-14w, wildcat, completed dry after acidizing for show of oil, T.D. 1,026 ft.



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PERMIAN BASIN, PANHANDLE

Deep Test Staked in Southern Part of Delaware Basin

By ROBERT INGRAM

MIDLAND, Tex. — Increasing interest in the southern portion of the Delaware basin is reflected in staking of Continental Oil Co. 1 J. H. Claypool, a 5,600-ft. rotary test located 13 miles north of Pure Oil Co.'s Chancellor pool in western Pecos County. The new operation is in NE SE Section 2, Block 50, Township 9, T.&P. Survey, being just across the county line from the old Bob Penn 1 Boles, a Delaware wildcat drilled about 10 years ago which logged a good show of oil, along with salt water.

Pure Oil 1 Odneal, third test in the Chancellor area, has cemented 5½-in. oil string at 4,648 ft., with total depth of 5,000 ft. It will rig up cable tools to drill ahead to the pay zone expected around 5,250 ft.

Magnolia Petroleum Co. 1 Robertson, wildcat 13 miles northwest of Fort Stockton, showed salt water on initial test at total depth of 6,561 ft. and has plugged off the bottom part of the hole to test higher zones.

Magnolia 1-29 H. J. Eaton is an important new 7,500-ft. Ordovician wildcat 7 miles southwest of the Abell field and on the northeast flank of the shallow Pecos Valley area. Rotary tools used on the Robertson test have been moved in to drill 1-29 Eaton. It is located 2,970 ft. from the northeast line and 990 ft. from the southeast line of Section 29, Block 3, H.&T.C. Survey.

Shell Oil Co. 2 Sealy-Smith, just northwest of Shell's 10,000-ft. Ellenburger producer in northeastern Ward County, showed 5,210,000 cu. ft. of gas daily on a 10-min. drill-stem test from 5,495-5,555 ft, with recovery of 210 ft. of gas-cut drilling mud. Zone tested was the upper part of equivalent of the Tubb section of the lower Permian. It was coring below 5,570 ft. at the end of the week.

Crane County Wildcat Shut Down

In southeastern Crane County, Skelly Oil 1 Richardson, "mystery" Ordovician wildcat, was shut down for orders at total depth of 5,743 ft. Log has not been released. It is reported to have found some showings around 5,250 ft., near top of the Simpson. Gulf 1 Dawson, new deep test about 7 miles north of the Skelly well, is rigging up rotary tools.

Gulf Oil also is building road and preparing to start drilling at 1 Estes, another deep wildcat location, in western Crane County, some 4 miles west of the Sand Hills Deep field.

Another big Ellenburger producer has been completed on the east edge of the south extension area of Sand Hills Deep at Gulf 7-B Tubb et al, rating potential of 7,638 bbl. a day after using 5,000 gal. acid at total depth of 5,676 ft. Atlantic Refining 1 Barnsley, on the southeast edge of this pool, is drilling below 3,500 ft.

Magnolia 1 Tucker, second test in the new Simpson sand Glenn pool, southern Crane County, is drilling below 3,450 ft.

Big Lake Oil Co. 1-C University, old well deepened from the 3,000-ft. pay zone to a total depth of 4,520 ft., has been abandoned after using nitro shot, with no results, at that depth. It is the company's second unsuccessful attempt to extend the one-well 4,300-ft. sand on the north flank of the Big Lake field.

Four rigs are running in the 9,000-ft. Barnhart pool in Reagan County. Amerada has two wells going, Ogden & Hawn have one, and Sharples Corp. has one. Rowan Drilling Co., George Livermore, Inc., and Noble Drilling Co. are doing the contract work in this field.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

Pecos County: Choate & Brown 1 Humble-University, Sec. 14, Blk. 20, University Sur., dry, Yates 570 ft., T.D. 1,507 ft.

Ward County: Lane Oil 1 Pat Wilson, Sec. 133, Blk. 34. H.&T.C. Sur., dry, Delaware 5,080 ft., T.D. 5,120 ft.

Fields

Apco-Warner, Pecos County: Anderson-Prichard 1 D. B. Gregg, Sec. 101, Blk. 10, H.&G.N. Sur., flowed 566 bbl. in 3 to 6 hr. through 29/64-in. tubing choke, natural, top Ellenburger 4,510 ft., pay 4,525 ft., T.D. 4,735 ft.

Big Lake, Reagan County: Big Lake Oil 21-C University, Sec. 24, Blk. 9, University Sur., old well old T.D. 2,972 ft., dry, T.D. 4,520 ft.

Byrd, Ward County: Stanolind 3 Byrd, Sec. 34, Blk. 34, H.&T.C. Sur., flowed 53 bbl. through ¼-in. tubing choke after shot, Yates sand 2,600 ft., pay 2,599 ft., T.D. 2,629 ft.

Colby, Winkler County: Tide Water 2 P. Cool, NE NE Sec. 82, Blk. B-3, P.S.L. Sur., flowed 465 bbl. through casing after shot, pay 3,150 ft., T.D. 3,322 ft.

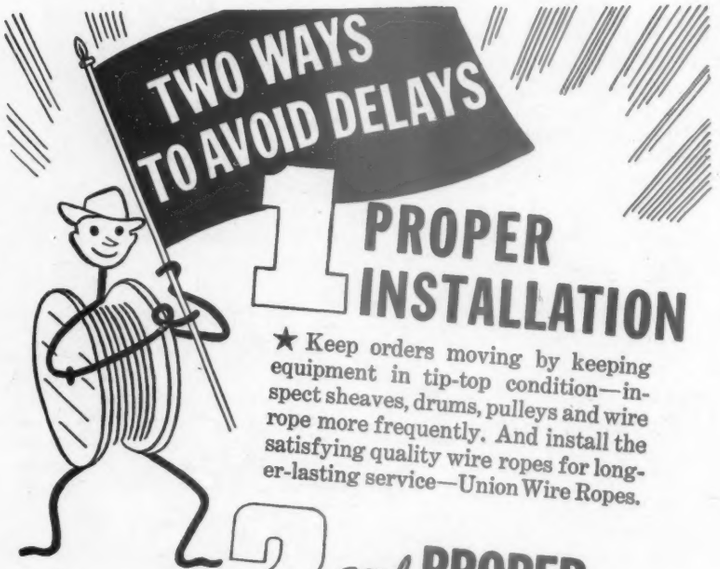
McCamey, Upton County: T. & P. Coal & Oil 52-A Lane, eSc. 5, G.C.&S.F. Sur., pumped 224 bbl. after acid and shot, pay 1,960 ft., T.D. 2,151 ft.

Taylor Link, Pecos County: Lynch Oil 1 University, NW SW Sec. 25, Blk. 16, University Sur., pumped 43 bbl. oil and 18 bbl. water after shot, pay 1,800 ft., T.D. 1,839 ft.

Weiner, Winkler County: J. R. Sharpe 3 Texas Co. Halley, SE NE Sec. 7, Blk. 11, P.S.L. Sur., flowed 397 bbl. through ½-in. tubing choke, natural, pay 3,040 ft., T.D. 3,128 ft.

Test Southeast of Shafter Lake Logs Showing of Free Oil

MIDLAND, Tex. — First showing of free oil logged by Union Oil Co. of California 1-C Means, wildcat 3 miles southeast of Shafter Lake in central Andrews County, furnished the only encouraging note last week among wildcats in northern part of the Permian basin. It bailed an estimated 5 to 6 gal. of free oil per hour from porous lime at 4,564-73 ft. At the close of the week the well


TWO WAYS TO AVOID DELAYS
1 PROPER INSTALLATION
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8-43

was shut down for orders at total depth of 4,710 ft. in lime. It has logged intermittent streaks of lime with oil stains and some porosity all the way from 4,485 ft. to total depth and looks like it should make some kind of producer when acidized or shot.

Atlantic Refining Co. 1-A Tex-U was drilling at 10,169 ft. in lime, shale and broken sand, apparently still in the Simpson lime section topped at 9,795 ft.

Fullerton Oil 2-A Wilson, on the southeast edge of the Fullerton field, gaged 992 bbl. a day through ½-in. choke from pay at 6,729-7,248 ft., after using total of 22,000 gal. of acid.

Humble Oil & Refining Co. has staked location for a north-edge test in the Means field at 1 Shultz, being the first operation for the field in months.

Stanolind 1-W University, ½ mile northwest of the Embar Ordovician field, quit at a total depth of 8,375 ft., above Ellenburger, and has plugged back to 4,400 ft. to try to complete in the regular Permian zone. It had some shows in the lower Permian, which might furnish gas or oil production, but short lease expiration prevents attempts to test them at this time.

Lubbock County Test Plugged Back

Lubbock County's lone wildcat test, J. R. Sharp 1 Elliott, located on Stanolind's Shallowater block in the northwestern part of the county, plugged back from a total depth of 6,411 ft. in lime to 6,025 ft. and is making a drill-stem test of the zone between 5,820-6,000 ft., which showed some porosity on an electrical log. It topped another zone at 5,530 ft. which also is scheduled for testing.

Continental Oil Co. 1 Dan Auld, eastern edge of Terry County, has been abandoned as dry, with no shows, at a total depth of 6,870 ft. in hard lime.

Humble Oil & Refining Co. 1 Newman, Ordovician wildcat 9 miles northwest of Snyder, Scurry County, was drilling at 6,475 ft. in hard shale and lime with no shows reported.

In Gaines County, the Texas Co. 1 Robertson, lower Permian discovery in the old Kirk-Dalmont area, was opened after being shut in a couple of weeks and flowed 78 bbl. of oil by heads in 48 hours, through open tubing. It is installing pumping equipment to complete in the pay at 5,910-50 ft. Shell Oil Co., Inc. 1 Leaverton, projected 7,500-ft. wildcat 4 miles southwest of the Wasson field, failed to show favorably in the regular Permian lime around 4,900-5,100 ft. and was drilling ahead at 5,495 ft.

Stanolind 1 Griffin, a 7,500-ft. Ordovician wildcat 20 miles east of Amarillo, and in the southwest corner of Carson County, was still having trouble trying to restore circulation at a total depth of 4,207 ft., where it blew out about 2 weeks ago making an estimated 150,000,000 cu. ft. of air daily, analysis showing it 97 per cent nitrogen, 2 per cent oxygen.

NORTHERN WEST TEXAS COMPLETIONS

Wildcats

Terry County: Continental 1 Dan Auld, SE NW Sec. 91, Blk. 4-X, D.&S.E. Sur., top anhydrite 2,204 ft., Yates sand 3,010 ft., brown lime 3,880 ft., top solid lime 4,345 ft., no porosity, dry, T.D. 6,860 ft.

Fields

Dean, Cochran County: Anderson-Prichard 3 Dean, Lge. 58, Martin C.S.L. Sur., 302 bbl. through casing after acid, pay 4,908 ft., T.D. 4,985 ft.

Anderson-Prichard 4 Dean, Lge. 58, Martin C.S.L. Sur., flowed 427 bbl. through casing in 6 hr. after acid, and shot, pay 4,897 ft., T.D. 5,259 ft.

Slaughter, Hockley County: Texas 4 Lucas, Sec. 7, Blk. X, P.S.L. Sur., elev. 3,548 ft., flowed 353 bbl. plus 6 per cent water through tubing after acid, pay 5,000 ft., T.D. 5,033 ft.

West Andrews, Andrews County: Phillips 14 University-Andrews, NW SE Sec. 12, Blk. 11, University Sur., elev. 3,295 ft., pumped 39 bbl. after acid and shot, pay 4,253 ft., T.D. 4,390 ft.

Stanolind 1-X University, Sec. 18, Blk. 10, University Sur., elev. 3,274 ft., dry, T.D. 4,500 ft.

(Continued on Page 92)

EASTERN TEXAS

Chapel Hill Field Extended Two Miles South in Pettit Zone

By ROBERT INGRAM

DALLAS, Tex.—Two deep tests in East Texas were abandoned last week, a small oil well extended the Pettit lime pay zone of the Chapel Hill field 2 miles to the south, and a deep Cherokee County wildcat is coring in the lower Glen Rose zone.

In Franklin County, J. B. White et al 1 Jackson, key wildcat on the Smackover lime trend along the Balcones fault system in northeastern Texas, and located on the big Talco fault, was plugged and abandoned at total depth of 9,084 ft. in solid salt topped at 9,048 ft. It had topped Buckner lime at 8,098 ft., the Smackover lime at 8,580 ft. and the Eagles Mills at 9,030 ft. The objective Smackover lime carried salty sulfur water.

Ohio Oil Co. 1 F. E. Hill, Jr., deepest Freestone County test, was abandoned at a total depth of 10,115 ft. in the Pettit lime and shale of the lower Glen Rose, having topped Pettit at 9,965 ft. No shows were found in the Pettit, nor in the Rodessa zone between 9,210-9,425 ft.

Sinclair Prairie 1 Swinney furnished a 2-mile-south extension to Pettit production on the south flank of the big Chapel Hill field in Smith County. Completed on gas-lift flowing 44 bbl. daily from pay at 8,158-8,280 ft., it will result in additional exploration in the wide area between it and the field.

Cherokee County Wildcat Coring Near Pettit Section

Magnolia 1 Braly, deep test on the Mixon prospect, and but 9 miles southeast of Humble 1 Curtiss, recent 10,000-ft. discovery at Larissa, started coring just below 8,520 ft., at which depth it is near the Pettit lime section. No shows have been reported since it entered the Rodessa zone at about 8,100 ft.

Magnolia 2 W. C. Campbell, ¼ mile northeast of the Concord field discovery well, northern Anderson County, was checking about flat with the discovery on markers down to 4,000 ft. and should be coring for the Woodbine around 4,500 ft. shortly. The discovery pumped low-gravity crude from Woodbine sand topped at 4,521 ft.

Another failure has been recorded in the Weiland field, Hunt County, on the south edge of the pool, by Iowa-Payne Oil Co. 1 Morrison. It had a slight show of oil and salt water in sand topped at 2,773 ft.

Delta Drilling Co. et al 1 Gentry, deep wildcat southwest of Athens, is making hole below 2,900 ft., and the same operators' 1 Goldsmith, deep wildcat on the Quitman prospect in central Wood County, is drilling below 3,720 ft.

Amerada continues rapid development of the Coke Paluxy sand field in Wood County, keeping five drilling rigs working. Only two other rigs are in the field, one on Jerry Hawkins 2 Clark, drilling near 6,000 ft., the other on General American 1 Skeen, southwest-edge test, which is still in process of completion.

P. D. Bowlen et al 1 Sims estate, Smackover lime wildcat 7 miles southwest of New Boston, Bowie County, is drilling below 6,420 ft. in shale and lime.

E. E. Hurley et al 1 Frost Lumber Co., Shelby County wildcat, is drilling below 6,820 ft. with no shows reported.

EAST TEXAS COMPLETIONS

Wildcats

Cherokee County: Humble 1 H. F. Curtis. J. Vaughn Sur., 3 mi. NW of Laressa, flowed 37.31 bbl. and 6 per cent b.s. and w. through ¼-in. choke, T.D. 10,604 ft.

Franklin County: Grady Vaughn 1 Jackson, J. E. Hopkins Sur., 1 mi. W of Talco, dry, Eagle Mills 9,030 ft., salt 9,048 ft., T.D. 9,084 ft.

Freeston County: Ohio 1 F. E. Hill, Jr., T. DuBronner, Jr., Sur., 5 mi. N of Butler, dry, Rodessa 9,210-9,425 ft., Pettit 9,965-10,108 ft., T.D. 10,115 ft.

McLennan County: Hughes 1 McCamie, L. B. Bailey Sur., junked, Eagleford 100-20, Walnut Bend 520-40 ft., Glen Rose 620-40 ft., T.D. 1,380 ft.

Fields

Cayuga, Anderson County: Tide Water and Seaboard 18 J. N. Edens, W. Snyder Sur., flowed 27 bbl. through 1-in. choke on flow valve, T.D. 4,035 ft.

Chapel Hill, Smith County: Sinclair Prairie 2 G. R. Phillips, J. D. Parchman Sur., flowed 403.34 bbl. through choke, Pecan Gap 2,812 ft., Austin chalk 3,748 ft., Woodbine 3,950 ft., Goodlan 5,560 ft., Glen Rose 5,863 ft., first anhydrite 6,581 ft., massive anhydrite 7,167-7,428 ft., Jamestown 7,780 ft., Pettit 8,043 ft., first porosity 8,070-8,114 ft., second porosity 8,176-8,214 ft., third porosity 8 227-70 ft., Travis Peak 8,278 ft., perf., 8,073-8,144 ft., acid, T.D. 8,300 ft.

Chapel Hill, Smith County: Sinclair Prairie 1 Swinney, W. Lockheart Sur., potential 44.08 bbl. on gas lift, input ratio 600:1, T.D. 8,336 ft., 2 mi. extension.

Coke, Wood County: Hawkins 3 J. M. Clark, B. Smith Sur., flowed 113.7 bbl. in 8 hr. through ¼-in. choke, T.D. 6,404 ft.

Hawkins, Wood County: Humble 2 Jackson Chism, E. Wideman Sur., potential 96 bbl. in 6 hr. on ¼-in. choke, gravity 24.9, tested heavy oil in first perf. from 4,751-67 ft., 4,812-22 ft., reperf. 4,624-38 ft., lime and shale, T.D. 4,830 ft.

Humble 4 W. T. Minshew, J. B. Grain Sur., 92 bbl. in 6 hr. on ¼-in. choke, shale and red beds, T.D. 4,832 ft.

LOUISIANA GULF COAST

Acadia Parish Wildcat Catches Fire, Continues to Flow Oil

By F. L. SINGLETON

NEW ORLEANS, La.—In spite of limited wildcat operations, new reserves continued to be added to the Louisiana Gulf Coast. The district received its third discovery within as many weeks with the showing of Union Sulphur 1 J. P. Gueno, located in the Branch area, Acadia Parish. This well blew out, caught fire and is making considerable oil while fire fighters attempt to bring it under control. Attention was attracted to the area the previous week as the company cemented 7-in. casing at 10,252 ft. after side-wall cores and electrical surveys showed three gas sands at 9,510-30 ft., 9,838-54 ft. and 10,004-14 ft. After drilling plug, the well was drilled ahead with the sand logged at 10,410-10,420 ft. and at 10,430-47 ft. At this point the well began to "kick" and working pressure, which built up to 4,000 lb., cut out the braden head and the well blew out and caught fire. Location is in 51-8s-2e, about 5 miles west of the Bosco field and 7 miles east of the North Crowley field, along an immense salt ridge which has been traced in a northeast-southwest direction through Jefferson Davis, Acadia and St. Landry parishes.

Salt Dome Field Opened in La Fourche Parish

Another new salt-dome structure was added to the district by Gulf 1 Delta Securities, located on the Bully Camp prospect in 1-19s-2e, La Fourche Parish. This well was reported the previous week as having blown out at a depth of 1,374 ft., and additional information released during the week reveals that the blowout was caused by a sand showing gas at 1,145-56 ft., and the top of the cap rock is reported to have been logged at 1,365 ft. The formation was lime with some sulfur in the bottom of the core at 1,370-71 ft. At the close of the week the crew was cutting and pulling stuck drill stem.

A second producer was apparently assured the new producing area on the southwest flank of the Pine Prairie dome, Evangeline Parish, as Texas Co. 3 Le Danois Land & Stone Co. cored the discovery pay. Coring recovered 3 ft. of oil sand and broken sand showing oil at 9,365-80 ft. The well

(Continued on Page 92)

TEXAS GULF COAST

Austin County Test Shows Gas And Gas-Distillate Production

By F. L. SINGLETON

HOUSTON, Tex.—There were no outstanding developments in the Texas Gulf Coast district the past week. Field developments continued at a low ebb with the chief interest centered on scattered wildcat operations along the Wilcox trend as several tests were approaching critical stages.

In the Orange Hill area, Austin County, Ohio 1 Kaechele, V. Flores Survey, is drilling in shale below 10,088 ft. with additional showings of gas logged at intervals from 9,588-9,615 ft. This is a potential pool opener in view of drill-stem testing up the hole which showed for gas-distillate production. Gray & Wolfe 1 Grogan, southeast of the town of Magnolia, Montgomery County, is drilling in shale below 11,709 ft. with no showings of oil or gas reported. In the same county, George W. Strake 1 Guaranty State Bank is trying to free stuck drill stem at 10,500 ft., while the same operator's 1 Peel, 4 miles northeast of Montgomery, is drilling in shale below 8,100 ft. The three above-named wells have topped the Wilcox and are well into the section.

Several Tests Under Way in Coastline Area

Operators interested in development near the coastline were watching several operations. In the Halls Bayou area, Brazoria County, Humble 1-B Houston Farm Development Co., Perry & Austin Survey, was running an electrical log at a depth of 9,806 ft. and was expected to resume drilling. In the Velasco area, Amerada 1 D. J. Sullivan was drilling in sidetracked hole below 5,200 ft., having plugged back from a depth of 7,183 ft. due to stuck drill stem resulting from an attempted blowout. In the Chocolate Bayou area, Phillips 1 Bernerdina, a semiwildcat, had resumed drilling after clearing up a fishing job at 11,405 ft., while in the Bailey's Prairie area Glenn McCarthy 1 Munson was waiting on orders after running an electrical survey to a depth of 10,662 ft.

Northwest of Edna, Jackson County, Texas 1 Collier has been temporarily abandoned at a depth of 3,730 ft. after the well swabbed salt water with a trace of oil when tested through perforated casing at 2,479-83 ft. Additional development in the area is anticipated at an early date. This county, which has for the past 2 years been the most active area in the district, has begun to feel the effect of curtailed operation, and only two completions were reported during the week, these being in the Maurbro and North La Ward fields.

Humble Oil & Refining Co. completed a second producer in the new sand recently opened on the Danbury dome. The well is 1-B Bassett Blakely which is producing at the rate of 5½ bbl. per hour through a ¼-in. choke from a screen setting made at a plugged-back depth of 5,670 ft. Total depth is 5,870 ft.

TEXAS GULF COAST COMPLETIONS

Wildcats

Jackson County: Texas 1 Collier, temp. abandoned T.D. 3,730 ft.

Fields

Maurbro, Jackson County: Humble 7 Drushel, 463 bbl ¼-in. choke, sand 5,211-25 ft.

North La Ward, Jackson County: Stanolind 1 Bonnet, 59 bbl. oil and 563 bbl. salt water, perf. 5,131-34 ft., T.D. 5,700 ft.

Rocky Mountain Area

(Continued from Page 74)

for its 4 Government, C SE SW 18-35n-3w, on the plateau above the rim rock of the Kevin-Sunburst field. It is south of the three wells drilled in that area 2 years ago which opened a new pool. The three completions made from 120 to 250 bbl. each initial, high-gravity crude.

The Petroleum Products Corp., sole operator in the Hospah pool, McKinley County, New Mexico, has resumed drilling and has spotted its 29 State, C SW NE 36-18n-9w. The company supplies a small refinery at Prewitt, on the Santa Fe Railroad, from its Hospah wells.

WYOMING COMPLETIONS

Circle Ridge, Fremont County: Continental Oil Co. 3 Shoshone-767, NW NW SW 6-6n-2w, T.D. 561 ft., bailed 7½ bbl. an hour from the Tensleep.

Cole Creek, Natrona County: General Petroleum Corp. 5-22-P, NW NW SW 22-35n-77w, T.D. 4,531 ft., pumped 175 bbl. from the Shannon sand.

Lance Creek, Niobrara County: Continental Oil Co. 7 Apex-1, SW NE NE 34-36n-65w, T.D. 4,125 ft., top basal Sundance 4,095 ft., swabbed and flowed 25 bbl.

Oregon Basin, Park County: Ohio Oil Co. 8-A Wilson, NW NE NW 4-50n-100w, T.D. 3,779 ft., 5½-in. 3,775 ft., pumped 308 bbl. from the Ember.

MONTANA COMPLETIONS

Cut Bank, Glacier County: W. F. Sanders 2 Tribal-199, C SE SE 24-32n-8w, T.D. 3,086 ft., Cut Bank 3,028-76 ft., main pay 3,061-76 ft., swabbed 220 bbl. first 12 hr., then shot with 100 qt. at 3,058-80 ft., cleaning out and testing.

National Parks Oil Co. 1 Chatterton, SE SW NE 22-32n-6w, T.D. 3,393 ft., show of water in upper Cut Bank at 3,320-36 ft., dry in lower section at 3,350-79 ft.

Texas Co. 5-A Government, C NE NW 17-32n-5w, T.D. 2,915 ft., 7-in. 2,872 ft., Cut Bank 2,830-75 ft., main pay 2,885-90 ft., 400 ft. oil in hole, swabbed 35 bbl. first 24 hr. after shot.

Kevin-Sunburst, Toole County: Neptune Oil & Gas Co. 8 Seabrook, SW NE SW 19-35n-2w, T.D. 1,560 ft., P.B. to 1,534 ft., acid. 1,000 gal., pumped average 10 bbl. daily on 10-day test.

Kal-Bar Oil Co. 3 fee, C NE SE 13-35n-2w, T.D. 1,606 ft., 7-in. 1,515 ft., dry in contact, shot and then acid., swabbed 150 bbl. in 24 hr.

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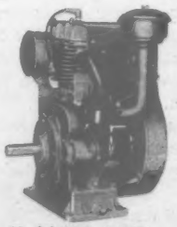
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OHIO, INDIANA, KENTUCKY

Clinton Sand Gas Pool Opened In Coshocton County

ZANESVILLE, Ohio.—A new gas pool was opened in the northwest part of Monroe Township, Coshocton County, with a 2,500,000-cu. ft. well. The Upham Gas Co. 1 H. B. Carter, SW Section 6, found the pay in Clinton, the sand was logged at 3,487-3,519 ft. with gas pay at 3,503-19 ft. A small oil showing was had at 3,518 ft. Total depth was 3,523 ft. Preston Oil Co. 1 Eliz. Buker, Section 8, Salt Creek Township, Muskingum County, was a prospective pool opener. It swabbed 160 bbl. of oil with a 300,000-cu. ft. gas flow after a shot in the Clinton. The sand was found at 4,193-4,229 ft., with oil pay at 4,209-29 ft. Total depth was 4,246 ft.

The second test by Hanley & Bird northwest of Orrville in Green Township, Wayne County, found the Clinton sand dry but made 500,000 cu. ft. of gas from the Newburg horizon after acid treatment. A partial log of the 1 L. J. Miller, Section 21, which flowed 213,000 cu. ft. of gas naturally, showed the lime at 2,175-3,370 ft.; Newburg 3,147-3,200 ft.; Clinton at 3,401-3,550 ft. Total depth was 3,594 ft.

SOUTHEAST OHIO COMPLETIONS

Hocking County, Ward Township: Ohio Fuel Gas Co. 7225 Sunday Creek Coal Co., dry, Berea, T.D. 1,079 ft.

Knox County, Butler Township: Upham Gas Co. 2 William Fry, dry, Clinton, T.D. 2,815 ft.

Holmes County, Washington Township: Ohio Fuel 1 Viola Workman, Sec. 6, dry, Clinton, T.D. 2,818 ft.

Licking County, Newton Township: Penick et al 10 Levi Lynn, third quarter, dry, Clinton, T.D. 2,602 ft.

Medina County, Hinckley Township: Belmont Quadrangle 1 Echo Lake, Inc., Lot 67, 20 bbl., treated with acid, Clinton shell 3,124-38 ft., Clinton sand 3,155-3,243 ft., dry, T.D. 3,269 ft.

Medina County, Chatham Township: R. C. Holmes et al W 19 A. B. and Mary Hostettler, dry, T.D. 560 ft.

Meigs County, Rutland Township: H. M. Nelson 1 L. H. Nelson, Sec. 27, dry, Maxon (water), T.D. 750 ft.

Pension Oil & Gas 2 J. T. Ledlie, Sec. 32, dry, Maxon (water), T.D. 810 ft.

Monroe County, Center Township: Kramer & Gillespie 10 Cora McCammon, Sec. 12, 6 bbl., Keener, T.D. 1,528 ft.

Byron Gillespie et al 1 Byron Gillespie, 8 bbl., Keener, T.D. 1,560 ft.

Malaga Township: Peters et al 2 Hila Ankrom, Sec. 28, 25 bbl., 100,000 cu. ft. gas, not shot, lime, T.D. 1,110 ft.

Morgan County, Marion Township: Jess Williams 1 E. Hammond, Sec. 16, dry, Maxon (water), T.D. 835 ft.

York Township: Industrial Gas Corp. 1 Lee Divers, Sec. 26, 13,000,000 cu. ft. gas, Clinton, T.D. 3,693 ft.

Muskingum County, Wayne Township: Atha Co. 1 Frank Fisher, Sec. 12, 650,000 cu. ft. gas, shot, Clinton and Medina, T.D. 4,097 ft.

Noble County, Enoch Township: Clymer et al 1 Lizzie Lincicome, Sec. 5, 30,000 cu. ft. gas, shot, Berea, T.D. 1,606 ft.

Perry County, Clayton Township: Preston Oil Co. 3 Joseph A. Wilson, Sec. 6, 38 bbl., Clinton, T.D. 3,250 ft.

Monroe Township: Marshall & Marshall 36 M. Donahue heirs, Sec. 14, 6 bbl., Berea, T.D. 1,148 ft.

Coal Township: Preston Oil 214 Sunday Creek Coal, Sec. 36, show oil and gas, Clinton, plugged, T.D. 3,650 ft.

Thorn Township: Palm Oil 2 F. E. Long, Sec. 14, 100 bbl., shot, Clinton, T.D. 2,695 ft.

Preston Oil 1 C. F. Helser, Sec. 24, dry, Clinton, T.D. 2,794 ft.

Tuscarawas County, Lawrence Township: Ohio Fuel 1 Caroline Geit, SE quarter, 785,000 cu. ft. gas, shot, Clinton, T.D. 4,747 ft.

Sandy Township: Natural Gas W. Va. 1 A. Penrod, Sec. 2, 200,000 cu. ft. gas, shot, Clinton, T.D. 4,990 ft.

Vinton County, Jackson Township: Ohio Fuel 1 Ida Wolf, Sec. 20, show gas, Clinton, plugged, T.D. 2,210 ft.

Washington County, Barlow Township: Anderson et al 1 J. Greenless, Sec. 33, 500,000 cu. ft. gas, Injun, T.D. 1,380 ft.

Decatur Township: Ohio Fuel 1 Martin Welch, Sec. 33, show gas, Berea, plugged, T.D. 1,789 ft.

Wayne County, Chester Township: Preston Oil 1 E. F. Piper, Sec. 29, 45 bbl., shot, Clinton, T.D. 3,245 ft.

INDIANA

EVANSVILLE, Ind.—Latest available reports indicated that Clarence E. Brehm et al were drilling plug at 1 Hardwick, prospective pool opener in SE SE SE 12-8s-14w. A test will be made of the Mansfield sand at 1,094-1,115 ft. Total depth of the hole is 1,135 ft. but cement plug was set at 1,115 ft.

Meanwhile, the same operator has made a location in SE SW SE 12-8s-14w for the 1 Hagman. The pool opened by the 1 Hardwick and in which the 1 Hagman is located will probably be named the Harvey Lake field.

Five operations are under way in the new oil pool about 2½ miles southwest of Evansville.

(Continued on Page 85)

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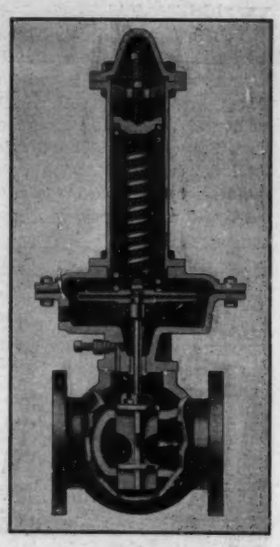

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NORTH CENTRAL TEXAS

Two Fort Worth Basin Wildcats Report Shows in Bend Section

By ROBERT INGRAM

WICHITA FALLS, Tex.—Production possibilities from the Bend lime and conglomerate section in two adjacent wildcats in the Fort Worth basin occupied chief attention in North Texas last week. In the extreme northwestern corner of Wise County, on the Park Spring prospect, Stanolind 1 Menasco plugged back from a total depth of 7,310 ft. in dry dolomite, perforated casing at 5,790-5,810 ft., swabbed tubing and developed a strong show of gas along with a good show of high-gravity oil. At the close of the week it was swabbing and flowing gas, oil, mud and probably wash water. It is the second test on the Park Spring prospect and may result in first oil production in Wise County.

Across the Wise-Montague County line, and 7 miles northwest of Stanolind's test, Sinclair Prairie 1 Eanes showed sufficient gas to blow mud over top of the derrick after perforating casing at 5,932-38 ft., and was bailing mud cut with oil and gas. Hole had been plugged back from a total depth of 7,070 ft. in dolomite. It topped the Caddo (Bend) section at 5,812 ft. Both the Stanolind and the Sinclair Prairie wildcats logged additional higher shows which will be tested if present zones fail to develop commercial production.

A small Simpson lime and sand producer is being tested at Continental Oil 1 Richardson. Bottomed at 7,263 ft. in sand, it makes approximately 3½ bbl. per hour on 20/64-in. tubing choke and dies when size of choke is increased. It is a southeast offset to Continental 1 Mueller, discovery well from same pay, located 5 miles east of Bowie. A mile northeast of the Gant-Turner field, Continental 1 Hildreth has opened a new Simpson-Ellenburger pay from 7,100-7,256 ft., total depth, flowing about 3 bbl. hourly on a small choke, with low pressures.

Blowout Prevented at Montague County Test

Sinclair Prairie 2 Henderson, twin well to a junked hole in the Denver area of Montague County, started gassing and threatened to blow out after perforating casing at 6,065-70 ft. in the Caddo section. Operators killed the well by pumping in heavy mud and have squeezed off the hole with 275 sacks.

In the 7,300-ft. Forestburg field, Sinclair Prairie has four operations under way, the deepest of which is their 1 Steadham, drilling at 4,200 ft. Magnolia 1 Medley, same field, is drilling at 6,235 ft.

Shell Oil 2 Brock, on the north edge of the Joy field, Clay County, has cemented 4½-in. pipe after logging saturated Mississippian lime at 5,916-30 ft., total depth. The Joy-Mississippian pay has yielded several prolific wells and the pay strata is exempt from all shutdowns. Youngblood & Foree 1 Sanzanbacher, wildcat on Gulf's farmout block 4 miles southwest of Henrietta, is drilling below 4,600 ft. in shale.

Young County operations are commanding considerable attention. Shell A-2 Bullock, ¼ mile south of the Padgett field discovery well, flowed 297 bbl. of oil and 86 bbl. of water in 3 hours through open tubing after using acid on the Mississippian pay at 4,776-88 ft. Standard Oil Co. of Texas and Hanlon-Buchanan, Inc. 1 Holbert, wildcat in Section 726, 9 miles west of Newcastle, was drilled to 5,276 ft. and bottomed in the Ellenburger. Casing was set and perforated at 4,658-63 ft. in the Mississippian zone. The well was treated with 3,000 gal. of acid, after which it swabbed dry. It had an oil show in the Caddo at 3,859-65 ft. which has not yet been tested. The same operators' 1 Sallie Donnell, Section 2371, T.E.&L. Survey, 14 miles southwest of Newcastle, is drilling below 4,060 ft. and reportedly logged a good show of oil in the Caddo, top of which has not been released. Ben Rankin and Elliott Production Co. have staked 1 G. P. Stewart, 1,055 ft. due east of Talbot and Robitaille 1 Ferguson, new Strawn sand discovery south of Markley in northeastern Young County.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Young County: Standard Oil of Texas et al 1 J. W. Daws, Sec. 751, T.E.&L. Sur., pumped 130 bbl. after acid, lime 3,847-60 ft., T.D. 3,860 ft., *discovery.*

Fields

Burkburnett, Wichita County: Akin & Dimock 3 E. E. Hardin, O. Farish Sur. A-838, dry, T.D. 1,572 ft.
Akin & Dimock 4 E. E. Hardin, potential 35 bbl., T.D. 1,333 ft.
Martin Properties 5 J. D. Cooper, Blk. 5-H, Hastie Sur. A-92, dry, T.D. 1,341 ft.
Ringgold, Clay County: The Texas Co. 2 H. D. Stine, Sec. 24, Blk. 4, H.&T.C. Sur., abandoned location.
Thornberry, Clay County: W. H. Peckham 1 C. T. Taylor Est., Blk. 73, Bacon subd., dry, T.D. 1,178 ft.

Miscellaneous

Archer County: L. T. Burns 2 F. McAnally, Meade L.M. Pastur subd., dry, T.D. 1,551 ft.
Consolidated Oil 1 L. F. Wilson Est., Sec. 107, A.T. N.C.L. Sur., dry, T.D. 1,465 ft.
Morgan & Turner 3 J. S. Dunham, Sec. 2436, T.E.&L. Sur., location abandoned.
White & Duncan 2 J. T. Richardson Est., M.E.P.&P. Sur. A-715, pumped 120 bbl., T.D. 1,190 ft.

NORTH CENTRAL TEXAS COMPLETIONS

Wildcats

Brown County: G. Greynolds et al 1 J. W. Newton, Sec. 25, B.B.B.&C. Sur., dry, T.D. 1,325 ft.
Taylor County: Drlg. & Exploration Co., Inc. et al 1 H. A. Freeman, Sec. 7, Blk. 18, T.&P. Sur., dry, T.D. 3,200 ft.

Fields

Albany, Shackelford County: C. B. Christie 1 W. P. Newell, Sec. 13, Blk. 11, T.&P. Sur., pumped 20 bbl., natural, oil show 1,006-18 ft., T.D. 1,020 ft.
Novice, Coleman County: Anderson-Prichard 4 O. B. Featherstone, Sec. 52, Blk. 2, G.H.&H. Sur., abandoned location.
Pickwick, Palo Pinto County: Albert W. Adkinson 8 Allen & Ritche, L. P. Pitts Sur., flowed 93 bbl. through ½-in. tubing choke, natural, gravity 36.5, gas show 1,499-1,501 ft., oil show 1,501-53 ft., T.D. 1,503 ft.
Wimberly, Jones County: S. C. Herring et al 2 W. P. Mashburn, Lot 86, Godwin subd. of De Witt C.S.L. Sur., flowed 126 bbl. in 3 hr. through ¾-in. tubing choke, natural, gravity 41.5, lime show of oil and gas 2,330-45 ft., T.D. 2,345 ft.

Oklahoma Fields

(Continued from Page 76)

Miscellaneous

Creek County: T. C. Greer 3 Dressler, SW NE SE 16-17n-8e, flowed 20 bbl., Prue 2,310-30 ft.
Sinclair Prairie 46 Keifer, SW SE SE 17-17n-12e, dry, T.D. 1,533 ft., sand 1,419 ft.
Okfuskee County: Ralph Vierson 2 Rentie, NW NE SE 24-12n-11e, dry, T.D. 3,510 ft.
Osage County: Berry Bros. 2, NE SE SE 20-21n-9e, dry, T.D. 2,637 ft.
Pittsburg County: J. E. Weible 4 Smith, SE SE NE 5-8n-16e, dry, T.D. 412 ft.
Seminole County: Jordan Pet. 1 Terrell, N½ NE NE 17-8n-8e, flowed 196 bbl., Hunton 3,946-66 ft., T.D. 4,268 ft.
Sequoyah County: Western Oklahoma Gas 1 Moore, W½ SW SW 17-10n-26e, 660,000 cu. ft. gas, sand 1,795-2,025 ft.
Tillman County: Burke Divide 246 Guthrie-0144144, NE SE NE 8-5s-14w, dry, T.D. 2,185 ft.

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CANADIAN FIELDS

Test in Taber Field Has Large Production

By VICTOR LAURISTON

CHATHAM, Ont. — In the Taber field, southern Alberta, Standard of British Columbia-Province 1, LSD 9, 18-9-16w4, producing from the Cut Bank sand at 3,168 ft., pumped 180 bbl. on the first 24-hour test. Later, production increased substantially, the well making 331 bbl. and 329 bbl. on successive days, rapidly filling available storage. Crude is being shipped to the Huff refinery at Lethbridge, and tests are continuing to determine the most satisfactory pumping procedure. The well is the largest crude producer in Canada outside Turner Valley. It was a joint test by Standard Oil of British Columbia and Nassau Explorations, Ltd. Location is about 3 miles south of the town of Taber. Standard 2, LSD 12, 17-9-16w4, recently finished dry at 3,240 ft., but additional tests will be drilled. The Clancey-Hi Test 1, LSD 7, 24-9-17w4, is sidetracking below 2,465 ft.

The Taber field lies on the west flank of the Belly River arch, which extends southward into Montana as the Sweetgrass arch. The regional dip in this general area is to the northwest.

TURNER VALLEY COMPLETIONS

Southern area of North Turner Valley: Royalite Oil 64, LSD 13, 22-20-3w5, T.D. 8,995 ft., Madison lime at 8,328 ft., initial production 636 bbl. daily after acidizing; completing tests for allowable.

North Turner Valley: Northend Petroleums 3, LSD 5, 20-21-3w5, temporarily abandoned in upper Blairmore formation at 9,137 ft.

Experiments in Production

With the Dr. G. Grainger Brown system of fixing quotas now in full force throughout Turner Valley, operators are to be permitted to conduct experiments on production. Under the Brown system, quotas are fixed on a basis of 25 bbl. of reservoir fluid per acre per day. To determine if individual wells can give better results under some other figure, operators will be allowed to conduct production experiments under the supervision of the Alberta Conservation Board. Experiments are limited to a maximum period of 90 days, but if unfavorable conditions develop may be summarily discontinued by the board. Operators are required to make written application to the board, giving details of the experiments they propose to undertake. Experiments are likely to be confined almost entirely to the older crude producers.

Vauxhall Survey

A potential northern extension of the Taber field in the vicinity of Vauxhall will be explored by Northwest Co., subsidiary of Imperial Oil, under an arrangement with Calgary & Edmonton Corp. Holdings cover some 38,804 acres in Townships 10 and 11, Ranges 16 and 17w4. Seismographic surveys have already been carried out, and a series of slim-hole tests will be drilled during the fall of 1942, to be followed by commercial tests in favorable areas. The area is about 18 miles north of the Taber field.

Standard Operations

In addition to its drilling in the Taber field, Standard Oil of British Columbia has located a test in the Ross Lake area, in LSD 4, 17-2-22w4, on E. L. Cord-Western Drilling acreage. This is the only one of the related group of Twin River-Del Bonita Coulee-Ross Lake structures to remain untested, all having shown good indications around the Madison contact. Location is 6 miles northwest of Del Bonita 1, a potential producer. Drilling will start this fall.

A seismographic crew from Dallas, Tex., is carrying on a survey for Standard Oil of British Columbia in an area close to MacLeod in southern Alberta.

In the Gaspe Peninsula of Quebec, south of the St. Lawrence River, Russell V. Johnson of Calgary has completed a survey for Paul Payette and associates of Montreal. On the basis of the survey, Mr. Johnson has located two tests for the Payette group. Payette 1 is in the Galt Brook dome area, approximately 700 ft. west of the brook. Payette 2 is on the Bald Mountain anticline, some 11,000 ft. north of the confluence of Patch Brook and York River. The group holds leases on some 85,000 acres, mostly unsurveyed territory. Interstate Royalty Corp. is among the backers of the Gaspe project, which is expected to start drilling within a few weeks.

Kamsack Gas Field

Drilling operations carried on since 1937 have resulted in the development of a considerable shallow gas area in the vicinity of Kamsack, in eastern Saskatchewan, close to

(Continued on Page 91)

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The Oil and Gas Journal Tulsa, Okla.

KANSAS, NEBRASKA

Large Producers Extend Peace Creek Field to East

By CARL HOOT

THE Peace Creek and Lindsborg pools of Reno and McPherson counties were the most active fields in Kansas over the past week. In the Peace Creek area, where the majority of wells completed over the past few weeks have been small, four new wells extended the central and northern areas to the east and were above average in production. One of the largest producers yet brought in for the entire field, Sinclair Prairie 2 Baughman, SW SW NE 1-23-10e, flowed 70 bbl. of oil an hour from Viola at 3,696-3,708 ft., pushing the Hendrickson border farther east. Another large well in the same area was Cities Service 4-B Hinshaw, SW NE 11-23-10w, which flowed 238 bbl. of oil in 8 hours. Barnsdall's 2 Blasdell, SW SW NW 13-23-10w, and Sinclair Prairie 2 Crandell, NE SE 14-23-10w, extended the old Northeast Peace Creek pool east.

In the two-zone Lindsborg pool, Mabee Oil & Gas Co. 1 Berglund, W½ SE SE 6-17-3w, pumped 49 bbl. of oil a day to extend the northwest Viola lime section ¼ mile. The east side of the field, just north of the town of Lindsborg and which produces from Simpson sand, was extended ½ mile by Auto Ordnance Corp.'s 2 Johnson, NW NE 8-17-3w and 2 Sandell, NE NE 8-17-3w. Both wells flowed at the rate of 60 bbl. an hour.

McLouth Gas Pool Gets Two Oilers

Two new small oil wells have been added to the McLouth pool. G. Billingsly et al 1 McLaughlin in NE SW NW 4-10s-20e, Jefferson County, had pay from 1,588 to 1,601 ft. in the McLouth sand. Potential was estimated at 50 bbl. of oil per day, 24° gravity. Sherrod 2 Bower in N½ SW NE 5-10s-20e, Jefferson County, had pay in the Mississippi lime from 1,643-48 ft. The lime was topped at 1,525 ft. Potential was estimated at 35 bbl. daily. Among new gas wells in the pool are the Hatcher & Fisk 2 Hesse in NW SW 21-9s-20e, Jefferson County, with pay at 1,458-60 ft. in the McLouth sand, potential was estimated at 11,700,000 cu. ft.; and the Charles Miller 1 Miller in NW SW 22-9s-20e, Leavenworth County, which produced 8,000,000 cu. ft. daily in the McLouth sand at 1,429-47 ft.

KANSAS COMPLETIONS

Wildcats

McPherson County: Westgate-Greenland 1 Crowther, S½ NW NW 26-17-1w, pumped 151 bbl., Mississippian chat 2,778-94 ft., T.D. 3,422 ft.

Cities Service 1 Goering, NE NW SE 31-18-1w, dry, T.D. 3,050 ft., Lansing 2,334 ft., Mississippi lime 3,050 ft.

Pratt County, NE of Preston: Black-Marshall Oil 1 Bauman, SW SW NE 8-26-11w, dry, T.D. 4,465 ft., Lansing 3,636 ft., Mississippi lime 4,056 ft., Viola 4,251 ft., Simpson 4,350 ft., Arbuckle 4,435 ft.

Rice County: Skelly 1 Shonyo, NW NE NE 10-18-10w, dry, T.D. 3,325 ft., Lansing 2,944 ft., conglomerate 3,246 ft., Arbuckle 3,295 ft.

Rush County: J. J. Lynn 1 Lyman, W½ SW NE 32-18-18w, dry, T.D. 3,908 ft., Lansing 3,446 ft., Arbuckle 3,862 ft.

Fields

Ainsworth, Barton County: Black-Marshall et al 2 Seyfert, SE NE 3-17-13w, pumped 748 bbl., Arbuckle 3,342-60 ft.

Beaumont, Greenwood County: K. T. Wiedemann 18-A Lewis, SE NE 35-27-8, pumped 15 bbl., Arbuckle 2,778-81 ft.

Chase, Rice County: Lebsack & Mabee 1 Siedd, N½ NW SW 34-19-9w, pumped 500 bbl., Arbuckle 3,211-30 ft.

Cunningham, Pratt County: Sam Springer 1-B Sutton, E½ SE SW 26-27-11w, pumped 67 bbl., Lansing 3,450-94 ft.

Gorham, Russell County: Texas 1-B Dumler, SW SE 1-14-15w, pumped 26 bbl., Gorham sand 3,295-99 ft., T.D. 3,302 ft.

Gustason, Russell County: Isern Bros. 1 Kaufmann, NE NW SW 14-15-12w, dry, T.D. 3,248 ft.

Iuka, Pratt County: Atlantic 1 Rolf, NE NW 14-27-13w, pumped 264 bbl., Simpson sand 4,350-55 ft.

Kraft-Prusa, Barton County: Shell 4 Disque, NE SE NE 22-17-11w, swabbed 69 bbl. in 4 hr., Arbuckle 3,276-94 ft.

Sinclair Prairie 3 Schmidt, NE SE NW 20-16-11w, pumped 72 bbl., Arbuckle 3,295-97 ft., T.D. 3,345 ft.

Lindsborg, McPherson County: Mabee Oil & Gas 1 Berglund, W½ SE SE 6-17-3w, pumped 49 bbl., Viola 3,356-65 ft.

Auto Ordnance 2 Johnson, NW NE 8-17-3w, swabbed 60 bbl. an hr., Simpson sand 3,442-54 ft.

Auto Ordnance 2 Sandell, NE NE 8-17-3w, swabbed 59 bbl. an hr., Simpson sand 3,456-66 ft.

Linwood, Leavenworth County: McLaughlin & Enoch 1 Schubert, SW NW 21-11-22, dry, T.D. 905 ft.

Lost Springs, Marion County: Ring-Mack 3 Jirak, W½ SE NW 4-18-4, pumped 164 bbl., Mississippi lime 2,382-2,405 ft., T.D. 2,412 ft.

Marshall, Ellis County: Lario Oil & Gas 12 Marshall, S½ SW 31-11-17w, pumped 296 bbl., Arbuckle 3,678-3,706 ft.

McLouth, Leavenworth County: Chas. Miller 1 Miller, NW SW SW 22-9-20, 8,000,000 cu. ft., Bartlesville 1,429-47 ft.

McLouth, Jefferson County: Billingsley et al 1 McLaughlin, NE SW NW 4-10-20, pumped 50 bbl., Mississippi lime 1,588-1,601 ft.

Morel, Graham County: Barnsdall 1 Davignon, SW SW 11-9-21w, pumped 761 bbl., Arbuckle 3,736-62 ft.

Continental 3 Trexler, NW SE NW 15-9s-21w, swabbed 133 bbl. in 4 hr., Arbuckle 3,667-92 ft.

Peace Creek, Reno County: Sinclair Prairie 2 Baughman, SW SW NE 1-23-10, flowed 70 bbl. an hr., Viola 3,696-3,708 ft.

Cities Service 4-B Hinshaw, SW NE 11-23-10w, flowed 238 bbl. in 8 hr., Viola 3,756-66 ft.

Barnsdal 2 Blasdell, SW SW NW 13-23-10w, flowed 24 bbl. an hr., Viola 3,742-54 ft.

Sinclair Prairie 2 Crandell, NE SE 14-23-10w, flowed 32 bbl. an hr., Viola 3,755-67 ft.

Ray, Phillips County: Cities Service 3 Veeh, SW SW NW 31-5s-20w, pumped 371 bbl., Lamotte sand 3,640-50 ft., T.D. 3,681 ft.

Stoltenberg, Ellsworth County: Vickers Pet. 2 Kralik, SE SW 8-16-10w, swabbed 20 bbl. in 1 hr., Arbuckle 3,312-20 ft.

Trapp, Barton County: Continental 1 Stoskopf, SE SW NW 20-16-13w, pumped 931 bbl., Arbuckle 3,387-3,400 ft.

MISSOURI

In Northwest Missouri, Cities Service 1 Gray, SW cor. 29-65n-39w, was dry and ordered abandoned at total depth of 2,427 ft. Bartlesville sand at 1,462-85 ft., which showed a stain of oil, was tested after the Hunton lime at 2,327-2,427 ft. was found dry. After setting plug at 1,475 ft. operators bailed a small amount of high-gravity oil which had a strong odor of kerosene.

MISSOURI COMPLETIONS

Atchison County, 3 mi. SE of Tarkio: Cities Service 1 Gray, SW cor. 29-65n-39w, dry, T.D. 2,427 ft., Bartlesville 1,462-85 ft., Mississippi lime 1,839-2,072 ft., Kinderhook shale 2,072-2,327 ft., Hunton 2,327-2,427 ft.

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NORTH LOUISIANA, ARKANSAS

Deep Test in Winn Parish Has Flow of Wet Gas From Wilcox

SHREVEPORT, La.—The middle Wilcox trend, extending through South Central Louisiana, listed another Wilcox discovery as H. L. Hunt 1 24-F Good Pine Oil Co., a wildcat located 14 miles northwest of the town of Winnfield, Winn Parish, flowed an estimated 2,000,000 cu. ft. of wet gas daily while testing through a ¼-in. choke. Tubing pressure was 1,650 lb. and shut-in casing pressure 1,000 lb. This well was drilled to a total depth of 9,718 ft. and was temporarily abandoned several weeks ago, although showing of oil and gas had been reported. In completing the well, the operator moved in a portable rig and perforated casing opposite sand at 5,786-94 ft. The well is being tied in with the separators and is to be officially gaged the first of the week. It has been drilled extremely tight and geological markers and other details are not available. It is one of the few deep tests drilled along the trend and broadens the play a considerable distance. Location of the new pool is in 13-12n-5w.

In Bossier Parish, 4 miles northeast of Carterville in 5-23n-11w, H. L. Hunt had promise of another new discovery with the showing of 1

SUMMARY OF OPERATIONS, AUGUST 1941

	Comp.	Oil	Prod.	Gas	Dry	Completions Under 1,000 ft.	1,000-2,500 ft.	2,500-5,000 ft.	5,000-10,000 ft.	Over 10,000 ft.	Footage	Drlg.
Appalachian	240	168	367	58	14	8	186	28	18	0	496,080	311
Ohio	102	20	887	57	25	22	24	55	1	0	259,775	211
Indiana	34	13	1,187	2	19	7	14	13	0	0	74,387	47
Kentucky	14	1	5	11	2	1	4	9	0	0	39,200	42
Michigan	61	25	9,585	8	28	0	27	34	0	0	162,187	118
Illinois	146	78	9,872	1	67	5	35	106	0	0	386,938	209
Kansas	149	88	36,813	6	55	2	15	132	0	0	485,060	205
Nebraska	2	1	64	0	1	0	0	2	0	0	6,575	15
Missouri, Iowa	1	0	0	0	1	0	0	1	0	0	3,513	3
Oklahoma	58	24	4,540	3	31	2	13	35	8	0	209,600	204
North Texas	52	29	17,899	3	20	4	14	21	13	0	186,943	75
West Central Texas	32	14	2,164	2	16	2	19	11	0	0	73,625	34
Northern West Texas	58	52	31,331	0	6	0	2	21	35	0	283,838	54
Southern West Texas	38	30	21,991	0	8	0	13	18	6	1	137,081	33
Texas Panhandle	24	14	2,441	9	1	0	0	24	0	0	73,232	21
East Texas	41	21	3,337	1	19	0	1	28	12	0	198,494	45
Upper Gulf Coast	46	26	4,892	4	16	0	0	3	39	4	321,126	84
Lower Gulf Coast	39	28	3,428	0	11	0	0	7	32	0	244,296	42
South Central Texas	2	0	0	0	2	1	0	1	0	0	5,102	13
South Texas	23	8	518	0	15	0	7	9	7	0	101,936	25
Southeast New Mexico	15	10	922	0	5	1	1	11	2	0	56,009	60
Arkansas	21	8	1,054	0	13	1	3	6	11	0	106,725	34
North Louisiana	36	26	4,638	1	9	1	2	15	17	1	169,328	65
Louisiana Gulf	29	17	3,281	0	12	0	1	1	16	11	221,386	67
Mississippi	6	0	0	0	6	0	0	1	5	0	35,747	15
Alabama	2	0	0	0	2	0	1	0	1	0	8,621	3
Montana	24	10	967	12	2	5	11	8	0	0	45,891	75
Wyoming	9	6	2,550	2	1	0	1	5	3	0	40,295	74
Colorado, Utah	1	0	0	0	1	0	0	0	1	0	6,200	38
Northwest New Mexico	1	1	25	0	0	0	1	0	0	0	2,456	12
California	41	27	12,974	1	13	6	7	10	13	5	201,490	99
Florida	0	0	0	0	0	0	0	0	0	0	0	4
Total August	1,347	745	180,732	181	421	68	402	615	240	22	4,643,136	2,337
Total July	1,578	833	197,613	224	521	74	577	665	232	20	5,065,773	2,384
Difference	231	88	16,881	43	100	6	175	50	8	2	422,637	47

Bilbray. The Pettit lime was topped at 5,946 ft. and 4 ft. of medium porous lime with a good stain and oil odor were recovered in a core at 5,946-66 ft. The well is coring below 5,975 ft.

NORTH LOUISIANA COMPLETIONS

Wildcats

Bossier Parish: Robbins & Lewis 1 Ellerbe, NW NE NE 3-20n-13w, dry, T.D. 2,270 ft.

Caldwell Parish: W. B. White 1 McDaniels, SW SE 10-11n-3e, dry, T.D. 4,080 ft.

Morehouse Parish, 5 mi. E of Monroe Gas: Union Producing Co. 1-A Crossett Lbr. Co., SW NE NE 6-22n-6e, flowed 25 bbl., Cotton Valley 3,700-11 ft., T.D. 6,956 ft.

Sabine Parish: Brown & Wood 1 Foster, NW NW 35-6n-13w, dry, T.D. 4,555 ft.

Winn Parish: Placid Oil 1 Davis, SE SW 19-13n-2w, dry, T.D. 6,450 ft.

Fields

Caddo, Caddo Parish: Glenrose Gas Co. 1 Stiles, NW NW 22-21n-16w, dry, T.D. 5,400 ft.

Haynesville, Claiborne Parish: Midstates Oil 1-A Wynn, NE SE 8-23n-8w, flowed 530 bbl., Smackover 5,386-96 ft., T.D. 5,482 ft.

Homer, Claiborne Parish: Texas 5-A Shaw, SW NW 30-21n-7w, dry, T.D. 2,123 ft.

Joaquin, De Sota Parish: Arkansas Louisiana Gas 1 A W. Wells, NE NE SW 31-12n-15w, 100,000,000 cu. ft. gas, pay 4,868-82 ft., 4,896-4,940 ft., T.D. 5,025 ft.

Lisbon, Claiborne Parish: Union Producing 1 Duke, C SW 18-21n-4w, flowed 17 bbl. condensate, pay 8,505-25 ft., T.D. 11,455 ft.

Monroe Gas, Union Parish: J. E. Farrell 41 State, W½ NW NE 4-20n-4e, 6,208,000 cu. ft. gas, pay 2,079-2,136 ft.

Nebo, La Salle Parish: H. L. Hunt F-120 Goodpine, NE NE 8-7n-3e, flowed 115 bbl., pay 3,626-29 ft., T.D. 4,089 ft.

Pine Island, Caddo Parish: Magnolia Pet. 41 Doan-Thigpen, NE cor. 6-20n-15w, flowed 70 bbl., pay 1,353-1,540 ft.

Sugar Creek, Claiborne Parish: White & Hinton 2 Byrd, NE cor. 18-19n-5w, 8,000,000 cu. ft. gas, pay 5,802-18 ft., T.D. 5,938 ft.

Indiana Fields

(Continued from Page 81)

The Sells Petroleum, Inc., are deepening the 1-A McCarty unit, SW NE NW 32-6s-11w, in the Waltersburg sand at 1,755 ft. Top of the sand was encountered at 1,755 ft., and from present indications the thickness of the sand zone in the field is about 20 ft. Other operations in the field include the Sells Petroleum 2-A J. A. McCarty unit, NE NE NW 32-6s-11w, where preparations are under way to core the Waltersburg sand; Sells Petroleum 2 J. A. McCarty, SE NW NW 32-6s-11w, which is being tested; and the George Nelson et al 2 Perry and Stader, NW SE NW 32-6s-11w, drilling at about 1,000 ft. All information available from these tests lead operators to believe that an excellent pool will be developed in the area.

INDIANA COMPLETIONS

Lawrence County: D. B. Lash 1 Ray, NE SW NE 3-5n-1e, dry, T.D. 1,856 ft., Devonian 769 ft., show oil.

Pike County: Indian Farm Bureau 1 Fowler, SE NE SE 24-1n-7w, 700,000 cu. ft. gas, Aux Vases sand 914 ft., T.D. 919 ft.

Posey County: W. C. McBride 2 McCoy, SE SW NW 3-4s-14w, dry, T.D. 2,832 ft., Aux Vases sand 2,807 ft.

W. C. McBride 1 McCoy, NW NW SW 3-4s-14w, pumped 230 bbl., Aux Vases 2,833 ft.

Longhorn Oil 2 Greathouse, SW NE NE 18-7s-14w, flowed 158 bbl., Palestine 1,779 ft. and Cypress 2,457 ft., T.D. 2,925 ft.

Porter County: E. Hostetler 1 Goodposter, NW SE SE 10-32n-5w, dry, T.D. 146 ft.

Spencer County: R. H. Compton 12 Stewart, SE SW SW 27-6s-5w, dry, T.D. 1,240 ft.

Sullivan County: Niagra Oil Corp. 20 Blount, NW SE NE 1-8n-10w, dry, T.D. 664 ft. in sand, show oil.

Niagra Oil 21 Blount, NE SE NE 1-8n-10w, dry, T.D. 658 ft. in sand, show oil.

Ohio Oil 1 Bland, NW SW 3-8n-10w, flowed 196 bbl., pay 2,361-79 ft.

Burr Lambert 1 Hayden, NE NW 10-8n-10w, dry, T.D. 2,572 ft.

Wayne County: E. L. Root 2 Teeters, NE SE SW 23-17n-12e, 20,000 cu. ft. gas, Trenton 865-75 ft., T.D. 920 ft.

EASTERN KENTUCKY

ASHLAND, Ky., Oct. 9.—Only one gas well was completed in the eastern Kentucky fields this week but drilling operations, as a whole, continued to show some slight improvement. Several new locations have been reported, especially in the past 3 days and it seems that there will be little change in the activities in the oil and gas areas during the next few weeks.

Magoffin County: Inland Gas Corp. 237 J. H. Hammons et al, Licking River, 582,000 cu. ft. gas, T.D. 1,289 ft.

APPALACHIAN FIELDS

Deepening Operations Under Way At Chestnut Ridge Test

PITTSBURGH, Pa.—On Chestnut Ridge, South Union Township, Fayette County, New Penn Development Co., William E Snee et al have commenced deepening operations in 4 Leo Heyn from a depth of 6,533 ft. and are now drilling at 6,646 ft., carrying 2,150,000 cu. ft. of gas.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Bethel Township: Local Co. 2 Hannah Hellman, 170,000 cu. ft. gas, Hundred-foot, Thirty-foot, Fifth and Tiona sands, T.D. 3,100 ft.

Red Bank Township: Wray, Sedgwick & Crum, 1 Neese, 1,500,000 cu. ft. gas, Murraysville 881 ft., gas 885-92 ft., T.D. 894 ft.

Clarion County, Limestone Township: George Hall 2 Perry Thompson, 90,000 cu. ft. gas, T.D. 2,776 ft.

Fayette County, German Township: Duquesne Nat. Gas Co. 1 Chas. S. Honsaker, 750,000 cu. ft. gas, Big Injun 1,425 ft., gas 1,432-38 ft., T.D. 1,543 ft.

Greene County, Gilmore Township: Equitable Gas Co. 1 Marion Kuhn, 794,000 cu. ft. gas, Big Injun 2,244 ft., gas 2,330-32 ft., 2,335-39 ft., T.D. 2,340 ft.

Wayne Township: Manufacturers L. & H. Co. 1 W. R. Tustin, 155,000 cu. ft. gas, Bayard 3,448-60 ft., gas 3,449 ft., T.D. 3,488 ft.

Whiteley Township: Manufacturers L. & H. Co. 1 Frank Baily, 86,000 cu. ft. gas, Bayard stray 3,291-3,305 ft., gas 3,298 ft., T.D. 3,361 ft.

Washington County, Morris Township: Union Gasoline & Oil Corp. 6 W. E. Craft, 167,000 cu. ft. gas, Nineveh-Thirty-foot 2,592-2,622 ft. gas 2,594 ft., T.D. 2,625 ft.

Westmoreland County, Bell Township: Peoples 1 Chris Bowman, 184,000 cu. ft. gas, Speechley 2,891-97 ft., gas 2,892-95 ft., Tiona 2,974-80 ft., gas 2,977 ft., T.D. 3,511 ft.

Washington Township: Peoples 1 W. D. Robertson, 46,000 cu. ft. gas, Hundred-foot and Thirty-foot, T.D. 3,704 ft.

WEST VIRGINIA COMPLETIONS

Calhoun County, Sherman district: Bowser Gas Co. 3 Edith Z. McDonald, deepened from 2,188 ft., dry, T.D. 2,565 ft.

W. V. Knight 1 Lawrence Wade 5 bbl., Big Injun, T.D. 2,178 ft.

Clay County, Henry district: Virginian Gasoline & Oil Co. 1326 Brown, Swann et al, 2 bbl., Big Injun, T.D. 1,917 ft.

Doddridge County, Grant district: L. G. Piggott 1 Ada G. Koch and John T. Williams, 114,000 cu. ft. gas after shot, Gordon, T.D. 2,483 ft.

Harrison County, Eagle district: Hope Nat. Gas Co. 8630 A. J. Reynolds 173,000 cu. ft. gas, Fourth, T.D. 2,647 ft.

Kanawha County, Malden district: Ira W. Belsher 1 Perryville C. & M. Co., 84,000 cu ft. gas, Big Injun, T.D. 1,397 ft.

Lewis County, Freemans Creek district: McCall Drilling Co., Inc. 2 M. H. Piercy, 35,000 cu. ft. gas, Big Injun, T.D. 2,160 ft.

Lincoln County, Jefferson district: Turtle Lick Gas Co. 1 James F. Thompson, deepened from 2,282 ft., 561,000 cu. ft. gas after shot, brown shale, T.D. 3,486 ft.

Pleasants County, Clay district: Elk River Gas Co. 2 Weatherell estate, 481,000 cu. ft. gas after shot, Big Injun, T.D. 2,159 ft.

Union district: Don E. White et al 1 O. C. Barkwill, 4 bbl., Big lime, T.D. 1,633 ft.

Putnam County, Scott district: Liberty Oil & Gas Co. 1 S. E. Toney, dry, T.D. 2,140 ft.

Teays Valley district: Smith Oil & Gas Co. 1 J. M. Smith, dry, T.D. 1,661 ft.

Upshur County, Buckhannon district: Pittsburgh & W. Va. Gas Co. 7855 B. S. Messenger, 2,375,000 cu. ft. gas, Fifth, R.P. 1,020 lb., T.D. 2,863 ft.

Meade district: Standard Gas Co. 1 D. A. Phillips, 2,157,000 cu. ft. gas, Fifth, T.D. 1,972 ft.

Wayne County, Butler district: Chartiers Oil Co. 3 Oliver Viers, 2 bbl., Berea, T.D. 2,087 ft.

Wetzel County, Church district: Fred Lough et al 1 D. L. Himelrick & Eliza Church, 160,000 cu. ft. gas, Fifty-foot, T.D. 2,810 ft.

ORISKANY GAS FIELDS

Jackson County, Ripley district: Columbian Carbon Co. 1 Parsons Burch, dry, show gas for 60,000 cu. ft. after shot, Oriskany 5,089 ft., T.D. 5,178 ft.

Columbian Carbon Co. 1 J. H. Easter, 862,000 cu. ft. gas after shot, Oriskany 5,124 ft., T.D. 5,207 ft.

United Fuel Gas Co. 1 E. E. Simmons, 7,958,000 cu. ft. gas, Oriskany 5,234 ft., T.D. 5,257 ft.

Columbian Carbon Co. 1 Elda Casto, 10,193,000 cu. ft. gas, R.P. 1,740 lb., Oriskany 5,064 ft., T.D. 5,082 ft.

United Fuel Gas Co. 1 M. E. Bailey, 3,858,000 cu. ft. gas, Oriskany 5,119 ft., gas 5,123-33 ft., T.D. 5,140 ft.

Kanawha County, Union district: Godfrey L. Cabot Co., Inc., 8 Poca Coal Land Co., dry, 77,000 cu. ft. gas showing after shot, Oriskany 4,956 ft., T.D. 5,029 ft.

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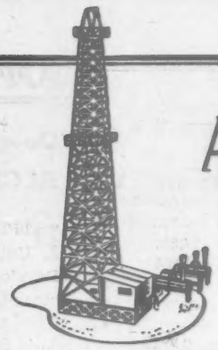

Among the Drilling

BYARS Drilling Co. has contract for Sinclair Prairie 3 Short, SW NE NE 27-17n-4w, in the Layton sector, Logan County, Oklahoma, which was drilling at 2,933 ft.

MABEE Drilling Co. has the contract for Sinclair Prairie 2 Knecht-A, C NW NE 28-18-4w, Logan County, Oklahoma, which was drilling at 4,176 ft.

SMITH BROTHERS Drilling Co. A-1 Billington, SE NE SE 22-9n-4e, Pottawatomie County, Oklahoma, has first Wilcox sand at 4,458 ft. in a core at 4,456-60 ft., total depth. Pipe was set atop the sand.

GRAY & WOLFE, Houston, Tex., has been awarded contract for Pan American Production Co. 1 M. J. Chambless, 2,640 ft. from north and 3,160 ft. from west lines of the W. F. Young Survey, proposed 6,500-ft. wildcat to the Wilcox sand. The location is 7 miles southeast of Madisonville, in Madison County, Texas. Pan American has approximately 4,000 acres around the wildcat.

DELTA Drilling Co. and Lone Star Gasoline Co. have spudded their 1 Gentry, C. M. Walter Survey, 8,000-ft. Travis Peak wildcat 3 miles southeast of Athens, in southwestern Henderson County, Texas, and set 1,400 ft. of 9⅝-in. casing and was waiting on cement.

W. B. HINTON has contract for the Wilcox horizon for Las Tecas Petroleum 1-A Weatherly, a wildcat in NE NE 38-12n-12e, in Tensas Parish, Louisiana.

R. P. COATS Drilling Co. has contract for D. D. Dunlap 1 J. W. Harris, SE 21-18s-39e, in the Hobbs area of New Mexico. The contract is for 4,200 ft.

RICHMOND Drilling Co. 1 Lyda Mae Johnson, Section 32, Block 42, Township 2s, T.&P. Survey, on the east side of the South Cowden pool, Ector County, Texas, has been completed for pumping potential of 420 bbl. of 32-gravity oil daily after shot with 550 qt. First pay had been encountered at 4,300 ft. and the well drilled to 4,473 ft.

SUMMIT Drilling Co., Tulsa, topped the Burbank sand at 2,943 ft. at its 1 McNeisch, C NE NW 35-31s-4e, Cowley County, Kansas, a semiwildcat. The hole was cored from 2,946 to 2,958 ft. and recovered 11 ft. of sand with good saturation. Casing has been set on top of the Burbank for a production test.

NOBLE Drilling Co. 1 Gregory, C SE NW 36-1s-24w, southwest of Eldorado in Jackson County, Oklahoma, was drilling at 4,950 ft. Contract is for 7,500 ft., or the Arbuckle. It is on a farmout from Stanolind Oil & Gas Co. Two more important wildcats in southwestern Oklahoma are assured through farmout deals by Stanolind to Noble Drilling Co. Noble has staked the 1 Herren, in C NW NW 11-4n-24w, west of Blake in southwestern Greer County, Oklahoma, on a block of 2,500 acres. Contract is for 4,000 ft. Noble will also drill the 1 Mayrhafen, C NE SW 32-2n-23w, southwest of Duke in western Jackson County, with contract for 7,500 ft. or the Arbuckle.

KERR-McGEE & CO. has drilling contract for Texas Co. 1 Patchell-Community, SW NE SE 25-4n-1w, Garvin County, Oklahoma, which was drilling below 2,100 ft. in shale.

BRYAN Petroleum Co., Tulsa, is doing the drilling on Burns Oil Co. 1 Kinch, NW SW SE 18-3s-10e, near Boggy Depot, in Atoka County, Oklahoma, was drilling below 600 ft. Contract is for 3,800 ft. Bryan has an interest in the block.

R. R. KIRCHNER, Bristow, Okla., has the contract and is using cable tools on H. Gussman 1 Lamas, SE NW SE 15-14-9e, near Newby, in Creek County, Oklahoma. Contract is for 3,800 ft. or the Wilcox sand.

CARL B. KING Drilling Co., Midland, Tex., has the contract for Ohio Oil Co. 1 State-McCormick, wildcat in 36-9s-37e, in extreme northeastern Lea County, New Mexico, which is shut down for orders at 5,421 ft. in lime. The well failed to encounter any showings in deepening beyond contract.

FALCON-SEABOARD Drilling Co. 1 Buchart, C N½ SE NE 14-20-11w, an old well being deepened from 3,312 ft., was making hole below 3,320 ft. It is 5 miles southeast of Ellinwood, in Barton County, Kansas.

CRESCENT Drilling Co. will drill Bruce Anthony 1 Giles, a wildcat deep test in Union County, Arkan-

Drilling crew of Hugh Pierce Drilling Co., in the East Edmond, Oklahoma, field. The men are James A. Wilson, pipe racker; S. A. Bishop, derrick man; George Cole, backup man; John Edwards, motorman; and W. T. Demson, driller

Contractors

sas. The test will be in C NE SE 26-16-14, about 10 miles northeast of El Dorado, and will be drilled in search of the Smackover lime production which is paying off in other fields in the state. Drilling operations are expected to start very soon, as quickly as rig and equipment can be moved to the location.

IRON Drilling Co. has been awarded contract to drill Nate Appleman Co. et al 1 Malin, in NE NE NE 13-25s-18w, about 8 miles west of Cities Service 1 English, Edwards County, Kansas.

JOHN D. FOX AND SON, Dallas, Tex., have contract to drill Ed J. Koeugh and John W. Emch 1 H. A. Bible, 2 miles north of the Putman area of northwestern Eastland County, Texas, and southwest of Cisco. The wildcat has been staked, and is being supported by several Dallasites, including Grady Vaughn, Allen Guiberson, John D. Mills, J. P. Kittrell and R. B. George. Kirby Petroleum Co., Houston, and Hickok and Reynolds, of Cisco, are also interested in the venture.

E. K. CAREY Drilling Co. and Derby Oil Co. are moving in materials for a new wildcat test for oil, the 1 E. R. Johnson, in C S½ SW SE 35-17-2w, 2½ miles southwest of production in the Roxbury pool of McPherson County, Kansas. Nearest test was the 1 Rolander, a dry hole, 2½ miles west.

OLSON Drilling Co. is using a slim-hole portable drilling rig to drill Tide Water Associated Oil Co. and Skelly Oil Co. 1 Smith, in NW SW SE 23-7n-20w, near Cambridge, of Kiowa County, Oklahoma, which was waiting on casing after spudding to 208 ft.

A BLOCK of about 24,000 acres of state-owned lands will be placed on the auction block by the Lands Division, Department of Conservation, State of Michigan, October 30, for oil and gas development rights. The sale will include lands in Bay, Clare, Gladwin, Grand Traverse, Midland, Oceana, Ogemaw, Osceola, Roscommon and Wexford counties. Following the most recent auction, department officials announced that state lands now under lease totals 433,000 acres. Summerfield Township, which adjoins Winterfield, attracted the greatest interest at the recent sale. Lupher Drilling Co. set the sale high with a bid of $510 to lease a 40-acre tract, SW SE 6. The total bonus paid was $8,383. All the leases sold were wildcat.

SPRENGER BROTHERS have been awarded the contract to drill E. W. Leeder 1 Johannes in SE NE NE 6-4n-14w, Allegan County, Michigan.

LUPHER Drilling Co. has the contract to drill Louis Rose 1 Beecher, C N½ NE SW 4-17n-10w, Osceola County, Michigan.

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Inventory of Idle Steel Stocks Gets Under Way

WASHINGTON, D. C.—First step in the War Production Board's huge steel-recovery program, involving the purchase and redistribution of millions of tons of iron and steel products, was taken last week with the mailing by the Steel Recovery Corp. of the first of 200,000 inventory certification forms to known and presumed holders of steel stocks rendered idle or excessive as the result of WPB orders and regulations.

Much of the iron and steel that soon will be directed into essential war production is available as the result of the series of orders, issued during the past few weeks, curtailing or eliminating use of these materials in the manufacture of hundreds of articles of everyday use.

Report forms now being mailed are simple one-page sheets on which recipients will indicate whether they hold steel inventories and, if so, the types of iron and steel of which they consist. Following receipt of this information, WPB will mail detailed questionnaire forms to cover each type reported, together with schedules of prices to be paid by the Government for material needed for the war effort.

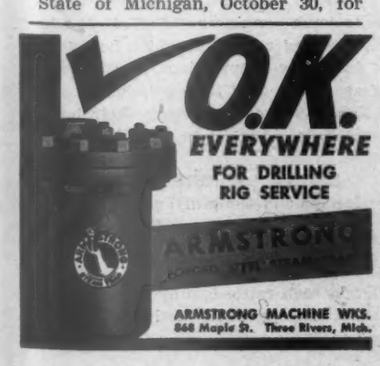
The forms now being mailed must be completed and returned to WPB, in care of Steel Recovery Corp., 5835 Baum Boulevard, Pittsburgh, Pa., not later than 5 days after their receipt by the firms to which they are addressed. Any stocks of the following are to be reported: Nonassembled carbon steel structural shapes, unfabricated and fabricated (including angles of all sizes and sheet piling); carbon steel ingots, billets, blooms, slabs; carbon steel forgings; carbon steel bars and nonassembled products fabricated therefrom; carbon steel wire and nonassembled products therefrom; carbon steel plates and nonassembled products therefrom; carbon steel sheet and strip and nonassembled products therefrom; carbon steel pipe and tubing and nonassembled products fabricated therefrom; carbon steel castings; alloy steel (other than castings) and nonassembled products fabricated therefrom; stainless steel (other than castings) and nonassembled products fabricated therefrom; alloy steel castings (including stainless steel castings); tool steel (high speed, alloy or carbon) in any form other than finished tools, dies and gages; iron castings; and wrought iron.

Officials of WPB's materials-redistribution branch emphasized the immediate need of steel in war industries, and pointed out that owners are permitted by Priorities Regulation 13 to sell directly to qualified users. They urged that those holding needed materials in idle or excessive inventories institute an immediate and intensive hunt for such customers.

In cases of direct sale, the owner receives the going price for his property and war industry benefits by speedy delivery of material which can be used in its present form. In this connection, it was pointed out that while government prices will be considerably above scrap prices, they will not equal the value of fabricated material, if the material must be remelted before it can take its place in the war effort. Scrap metal, as such, will not be purchased by the Government and should be disposed of through authorized dealers.

As an aid to direct transfers, the Steel Recovery Corp. will endeavor, wherever practicable, to bring together owner and potential buyer.

The Steel Recovery Corp. organized for the purpose last August, will carry out the purchase and redistribution program arranged by WPB and, as agent for Metals Reserve Co., will handle all fiscal matters involved in the thousands of transactions.



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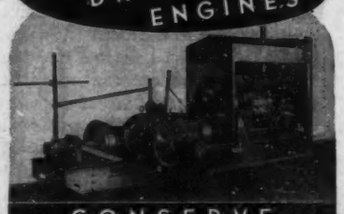

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Personal Paragraphs

R. B. ROARK, vice president, Shell Oil Co., Inc., and chairman of the scrap drive for the oil industry for Oklahoma, has appointed six committee chairmen, as follows: Production, H. M. STALCUP, Skelly Oil Co.; drilling, A. O. OLSON, Olson Drilling Co.; refining, E. M. DONS, Mid-Continent Petroleum Corp.; pipe line, B. P. SIBOLE, Stanolind Pipe Line Co., and natural-gasoline plant, R. E. MILLER, Hanlon-Buchanan, Inc.

J. A. UPTON, superintendent for Magnolia Petroleum Co. at St. Louis, Okla., has been moved to Drumright, Okla.

C. C. HEMSELL, geologist of Columbia Fuel Co., Amarillo, Tex., has been transferred to a new development by the firm in West Virginia.

H. GLENN COLE, engineer with Phillips Petroleum Co., Bartlesville, Okla., has been transferred from Aetna, Kans., to the Oklahoma City, Okla., division.

CHARLES S. JONES, president, Richfield Oil Corp., Los Angeles, Calif., is state chairman of the National Foundation for Infantile Paralysis, Inc., for California.

B. B. HAYES, formerly chief scout and now land man for Skelly Oil Co., with offices at Ardmore, Okla., has been temporarily assigned to the headquarters office at Tulsa.

"BUD" HARDER, superintendent at Oklahoma City, Okla., for Cities Service Oil Co., reported last week that 75 per cent of the leases in the Oklahoma City field are clean of all scrap.

J. B. MEYERS, director of production of Imperial Oils, Ltd., of Toronto, Canada, was a vistor in the Mid-Continent recently. While in the region he visited his sister in Seminole, Okla.

C. R. McMILLIN, a member of Standard Oil Co. of California's official family for the past 24 years, has been appointed district sales manager of the company's new Long Beach sales division, which will have supervision over all sales in Ventura, San Luis Obispo and Santa Barbara counties west of the mountains, and parts of Los Angeles, San Bernardino and Riverside counties.

J. H. ECHTERHOFF, formerly a chemical engineer in the general office gasoline department of United Gas Pipe Line Co. and now stationed at A. & M. College, College Station, Tex., has just received a promotion as captain in the Army, and is expecting to be transferred soon.

J. R. MULVEY, who for the past 12 years has been chief accountant of the sales department of Humble Oil & Refining Co., Houston, Tex., has been named assistant comptroller of the company. E. M. TOLAND, assistant to Mr. Mulvey since 1932, becomes chief accountant of the sales department. R. E. BREWER, formerly head of the general accounting and statistical section of sales accounting, has taken over Mr. Toland's duties.

R. F. ROOD

R. F. ROOD has been appointed land man for the Wichita, Kans., district of Phillips Petroleum Co., which includes all of Kansas, Nebraska, Missouri and eastern Colorado. Mr. Rood, formerly an independent operator at Enid, Okla., replaces P. H. PIGGOTT, who has been transferred to the Oklahoma City land office of Phillips. Mr. Rood was born in Caruthersville, Mo., and moved to Bartlesville in 1921, when he went to work for the H. V. Foster interests. He was with I. T. I. O. for 10 years, leaving to go into business for himself in 1938.

Do You Remember?

From The Oil and Gas Journal Files

30 YEARS AGO

The demand on the iron and steel mills has been so great of late that the concerns are all running behind in their orders. The delay in deliveries is not confined to oil-country goods.

A bill introduced in Berlin, Germany, would bar Standard Oil Co. from wholesale business in illuminating oils in Germany, which is to be intrusted to a national stock company operating under governmental supervision.

R. Otis McClintock, chief clerk of the land department of Gulf Pipe Line Co., accompanied the queen of the Tulsa durbar in a street parade that featured the handsomely decorated floats of many oil companies.

20 YEARS AGO

John H. Markham and family have returned to their home in Tulsa after a summer abroad. Much of their time was spent in France, with side trips through other continental countries and the British Isles.

Olean, N. Y.'s townlot drilling section is now known as "Little Oklahoma." Wells are going down every hour. Everywhere kitchen pumps are going with streams of oil going into barrels. The crude comes from gravel beds in which it was deposited, it is believed, by pipe-line leaks.

An order has been issued by the conservation department of Louisiana requiring all drilling wells to be marked with the owner's name and the designation and number of the well.

10 YEARS AGO

Lincoln Oil Refining Co. is completing the installation of an oil absorption plant and stabilizer at its Robinson, Ill., refinery. The unit replaces equipment which has been in operation for several years.

Major oil companies operating tanker fleets are considering a plan for the pooling of their vessels engaged in the intercoastal traffic and the movement of oil from South America to the United States in an effort to improve the tanker freight market.

STEPHEN A. GEORGE, attorney and one-time mayor of Ardmore, Okla., has joined the staff of the Independent Petroleum Association of America, and is stationed at Washington, D. C.

RUSH GREENSLADE, vice president and general manager of Gulf Oil Corp., of the Tulsa office, left Tulsa last Thursday for Lima, Ohio, where he was called by the death of his mother.

G. D. THOMAS, geologist for Shell Oil Co., Inc., has been elected president of the Shreveport Geological Society. R. M. WILSON was named vice president and T. H. PHILPOTT secretary-treasurer.

DOUGLASS P. JEPPE, of Ethyl Corp., addressed the Rotary Club of Pawhuska, Okla., last week, illustrating his address with motion pictures on the development of internal-combustion engines during the past 20 years.

HARRY BOTSFORD, assistant executive secretary to the Associated Petroleum Industries of Pennsylvania for the past 5 years, has resigned his position to join the staff of Hill & Knowlton, a New York firm specializing in public relations.

HOLLIS P. PORTER, veteran petroleum engineer of Tulsa, who authored a book in which he assembled the expressions, terms and words used in the oil industry, and Mrs. Porter are leaving their home in Tulsa to move to central Arizona.

LANNY TERRILL, production foreman of General Petroleum Corp. in the Mount Poso field of Kern County, California, is rapidly filling his annual quota of rattlesnakes, and each rattle is duly recorded and becomes a part of his collection board.

A. R. PATTEN has been transferred by Texas Co. from Calgary, Canada, to Salem, Ill.

LLOYD NOBLE, Ardmore, Okla., contractor-operator, has purchased a large ranch north of Roswell, N. M., and is undecided whether to raise cattle or sheep.

LYNN W. STORM, Corpus Christi, Tex., has resigned from his position with Schlumberger Well Surveying Corp., and has accepted a position in the strategic materials division of the U. S. Geological Survey.

BARTON P. SIBOLE, president, Stanolind Pipe Line Co., Tulsa, is in Louisville, Ky., attending the biennial convention of the United Lutheran Church. He is the lay delegate from the Kansas-Oklahoma Synod.

H. W. HARTS, vice president in charge of manufacturing for Warren Petroleum Corp., Tulsa, will discuss "The Role Being Played by Butane in the War Effort," at the October 26 meeting of the Seminole chapter of the A.P.I.

GEORGE H. G. CAULTON, executive assistant to G. R. COTTRELLE, Canadian oil controller, has been appointed a deputy oil controller. GEORGE DAVIES, previously supervisor of regional oil-control offices, has been named executive assistant in charge of oil rationing, replacing STUART ARMOUR, who has resigned to return to private business.

J. L. HAMILTON, who has been superintendent of the Grapeland recycling plant of Lone Star Gasoline Co. since June 1, 1940, has been appointed superintendent of the Opelika plant, full operation of which has been assumed by Lone Star. R. V. BURNS has been named to succeed Mr. Hamilton at the Grapeland plant. He will be assisted by T. R. SPARLING.

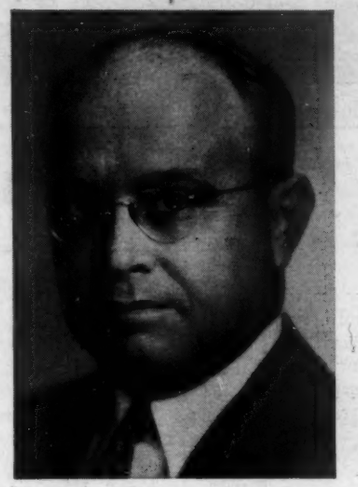
M. C. McGEHEE, head of McGehee Oil Co., Houston, Tex., and former head of Texas Gulf Producing Co., was recently commissioned a lieutenant colonel, and his duties will take him into foreign service in procuring gasoline and oil supplies for the American forces. He made a visit to Houston last week on his return from Washington, D. C., where he was commissioned.

W. L. LOONEY, assistant foreman in Lone Star Gasoline Co.'s Dallas, Tex., pipe-line district, assigned to Urbandale, has been transferred to Greenville, Tex., to take over pipe-line supervision in that area of the district. He succeeds A. B. FINLEY, who has been moved to Irving as utility man.

Shifts: W. H. SHIELDS, superintendent, Texas Empire Pipe Line Co. of Texas, Henderson, Tex., to Tulsa; L. O. WARD, superintendent, M. J. Delaney Co., Tulsa, to Abilene, Tex.; JOHN SHAFFER, superintendent, El Paso Natural Gas Co., Tucson, Ariz., to El Paso, Tex.; WILLIAM MONROE LAYTON, superintendent, Stackpole Oil Co., Centralia to Wilmette, Ill.; E. G. CROSS, superintendent, Ryan Consolidated Petroleum Corp., Codell to Plainville, Kans.; BURLIN E. FREEZE, engineer, Phillips Petroleum Co., Seminole to Bartlesville, Okla.; ROBERT S. COOKE, engineer, Carter Oil Co., Seminole, Okla.; to Great Bend, Kans.; HARRIS UNDERWOOD, JR., engineer, J. S. Abercrombie Co., Sweeny to Houston, Tex.; LOUIS O. STORM, engineer, Shell Oil Co., Inc., Monahans to Goldsmith, Tex.; J. C. MEGRAW, superintendent, Pure Oil Co., Cabin Creek, W. Va., to Marcus Hook, Pa.; P. F. ROTEN, engineer, Socony-Vacuum Oil Co., Inc., Brazil, Ind., to Martinsville, Ill.; JOHN M. PALMER, engineer, Shell Oil Co., Inc., White Castle to Lake Charles, La.; A. E. BERNDES, JR., Texas Co., Oberlin to Marksville, La.; S. S. GIEZENDANNER, engineer, Texas Co., Oberlin to Marksville, La.; H. B. MAUST, engineer, Texas Co., Oberlin to Marksville, La.; H. B. ARTHUR, engineer, Gulf Oil Corp., Philadelphia to Yeadon, Pa.

Oil's Chance Gain

J. H. Dunn, vice president and general manager of the Shamrock Oil & Gas Corp., Amarillo, Tex., who, according to his own assertion entered the oil and gas industry by accident, is making much more than a chance career out of his tenure of office.



J. H. DUNN

He had tentatively chosen the engineering phase of railroading as his vocation when, at the suggestion of a friend, he applied for employment with the Lone Star Gas Co., Dallas. Since that start in January 1926 Mr. Dunn's entire interest has been devoted to producing oil and gas and to other phases of the petroleum industry. He rose rapidly with Lone Star and when he left that organization in 1939 he held the position of chief production engineer.

From Lone Star, Mr. Dunn went to the Shamrock organization which at that time was undergoing some changes in executive personnel. He has held his present position since jointing Shamrock and has been instrumental in developing it into one of the strongest independent oil companies in the Southwest.

Mr. Dunn is a firm believer in keeping pace with technical developments, and he maintains close contact with associations and scientific groups in the industry. He believes that changes which are now taking place will completely alter the character of products manufactured from natural gas and natural gasoline and in their application to industrial requirements.

Shamrock's chief executive was born in Dallas County, Texas. He attended Dallas, Tex., public schools and Texas A. & M. College where he received his degree in mechanical engineering.

Mr. Dunn's principal interest, outside the office, is sports. His hobby is horseback riding.

WILLIAM E. WALLIS, geologist for Standard Oil Co. of New Jersey, has been sent to Costa Rica. He will reside in San Jose.

DR. ROY R. MORSE, manager of exploration, Shell Oil Co., Inc., Houston, Tex., addressed members of the Houston Geological Society at last week's meeting of that body. Dr. Morse spoke on "Geological Highlights of Unoccupied China," discussing the topographic and regional geological features and their intimate relations to the war.

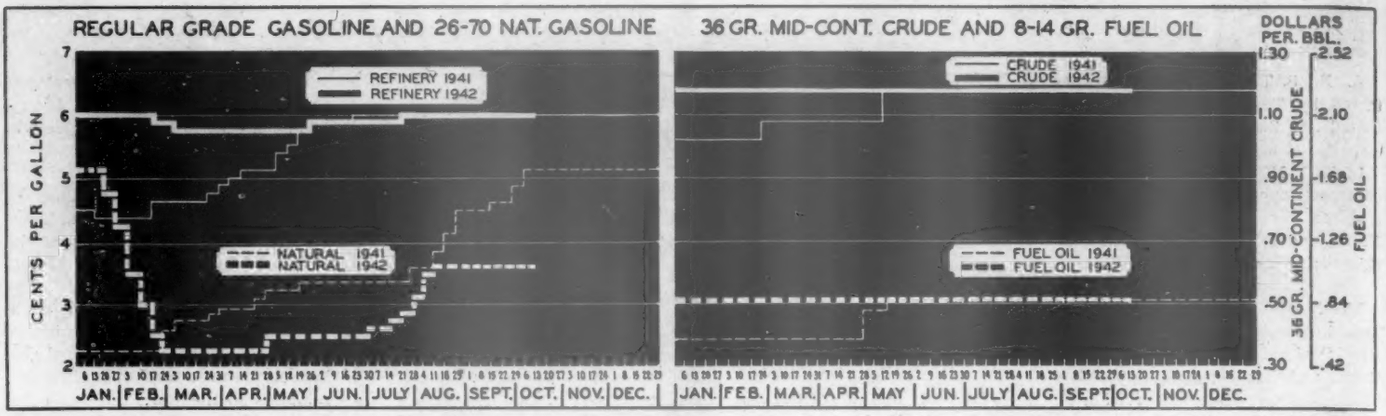
RAY HUNT, consulting geologist, has taken over the geological and scouting work for Gordon Oil Co., Mount Pleasant, Mich., formerly under the direction of WALTER WYCKOFF, now an officer in the Army. Mr. Hunt will continue to make his headquarters in Grand Rapids, and will carry on his consulting work in addition to his new activities.

JOHN M. HILLS has been elected president of the Midland, Tex., Geological Society, succeeding HARVEY HERD. E. HAZEN WOODS was named vice president, succeeding JACK BAILEY, and J. C. KIRKENDALL was elected secretary-treasurer, succeeding EUGENE VANDERPOOL. TOM KOCK is the new chairman of the entertainment committee, succeeding WARD WEST.

H. R. CULLEN, president, Quintana Petroleum Co., Houston, Tex., has been named chairman of the executive board of the Soldiers Service Bureau. Mr. Cullen is the former director of the Houston Community Chest. At last week's meeting of the Texas Mid-Continent Oil and Gas Association, he was recipient of the award for the most distinguished service rendered the industry during the past year.

D. E. CONAWAY, for several years chief geologist of United Natural Gas Co. at Oil City, Pa., has been elected a vice president of Pennsylvania Gas Co. and Pennsylvania Oil Co. at Warren, Pa. He fills a vacancy caused by the retirement of C. T. SLOAN. Mr. Conaway was transferred to Pennsylvania Gas Co. at Warren on June 1, 1941.

DR. PARKE A. DICKEY, senior oil and gas geologist with the Pennsylvania Topographic and Geologic Survey, has resigned from this post to become chief geologist for Forest Oil Co., Bradford, Pa. Although the resignation was submitted to become effective October 1. Dr. Dickey has consented to remain with the survey until November 15. A native of Illinois, Dr. Dickey was graduated from John Hopkins University, from which institution he received his Ph.D. degree in 1932. He was with Lago Petroleum Co. at Maracaibo, Venezuela, and with Tropical Oil Co. in Colombia before joining the survey in 1938.



MARKET DEVELOPMENTS . . .

Mid-Continent

PROSPECTS that federal orders will make a more substantial reduction in the refinery yield of gasoline and the anticipated difficulties of maintaining current shipments during the winter months combined this week to keep the Mid-Continent motor-fuel market in strong position. Most buyers were seeking additional supplies and were pressing refiners to ship full October commitments.

Failure of the interior gasoline market to react more promptly to the imminence of nation-wide rationing is another indication that suppliers realize that most of the resulting curtailment of consumption has been offset by voluntary conservation of tires. Many customers engaged in direct war production have indicated to refiners that their requirements are likely to increase.

Some suppliers are now booking business for November delivery. Preliminary indications are that refinery production, based as it will be on more rigid control of gasoline yields, may possibly fall short of curtailed requirements. Distributors are anxious to obtain supplies that will not be adversely affected by additional restrictions on tank-car movement or by inclement weather.

Rejection of the Petroleum Industry War Council's plea for postponement of the effective date of nation-wide rationing was not unexpected and had been discounted by most appraisals of the probable winter demand for motor fuel. Offsetting any unfavorable results of the determination of OPA to institute nation-wide gasoline rationing on November 22 was the more liberal policy developing in Washington on the problem of maintaining all essential automobile operation.

The OPA, accepting another strong recommendation of the Baruch rubber committee, definitely announced a policy of making tires or recaps available for all essential driving, the first official confirmation that such a policy will guide future application of war powers.

East Coast

NEW YORK.—Inability of the railroads and oil companies to boost shipments of crude oil and products by rail into District 1 above the 850,000-bbl.-per-day mark around which they have been fluctuating for the past 2 months is causing some concern. Rail shipments of this volume in addition to pipe line and barge deliveries and the intermittent tanker deliveries are inadequate to meet even rationed demand.

The reduction and concentration of terminals is expected to help considerably since it will permit faster turnarounds, the key to improvement in the rate of deliveries to the East Coast. However, it is expected to be some time yet before the steps that have been taken and are being taken in this direction will have any material effect.

If rail shipments reach a total of 950,000 bbl. daily before cold and snow force some curtailment, it is believed that essential demands will be met unless protracted, extremely cold weather is encountered. Functioning of the 24-in. pipe line by the first of the year is expected to offset the decline predicted in rail shipments but it is questionable if it will do much more.

The rationing of gasoline is estimated to have reduced demand for this product 250,000 bbl. per day and, as a result, gasoline inventories are in comparatively strong position. Even with conversion to the use of coal, saving a reported 100,000 bbl. of fuel oil per day, the seasonal position of this product is still unsatisfactory. If cold weather stimulates demand so that it dangerously exceeds supply, the flexible regulations governing fuel-oil rationing will be tightened.

SENTENCE SUMMARIES

MID-CONTINENT: Brisk buying of motor fuel continues. No adverse reaction yet apparent from imminence of rationing.

EAST COAST: Industry and OPC organizing for pooling of products. Improvement in general supply situation anticipated.

GULF COAST: Trading without particular feature. Lend-lease shipments remain important factor. Restrictions hamper domestic movement.

PENNSYLVANIA: All products firm with inquiries exceeding supplies. Neutral lubricating stocks sought more actively for winter operations.

PACIFIC COAST: Gasoline trading featureless at generally lower level. Fuels actively sought, particularly gas oil for blending.

A.P.I. REFINERY REPORT

Week Ended October 3, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
Appalachian	152	2,835	552	703
Ind., Ill., Ky.	748	14,249	3,493	6,088
Okla., Kans., Mo.	355	6,300	1,326	1,932
Censored area*	1,815	38,810	18,555	23,958
Rockies	103	1,713	552	452
California	706	16,454	54,558	12,617
Total Oct. 3, 1942	3,879	80,361	79,036	45,750
Total Sept. 26, 1942	3,802	80,550	78,943	45,945
Total Oct. 4, 1941	4,052	79,923	94,978	51,420

Note: Refinery runs and stocks for week ended October 10, 1942, appear on Trends page.

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended:	Bbl. of crude*
October 3, 1942	241,179,000
September 26, 1942	242,785,000
October 4, 1941	246,144,000

*Excludes heavy, unrefinable stocks in California.

Gulf Coast

HOUSTON, Tex.—Prices for all refined products held firm on the Gulf Coast refinery market this week. Demand for all grades of fuel oil continued heavy and material was hard to locate. Shipments of fuel oils are reported to have been increased over the past few weeks owing to the effort being made by refineries to boost tank-car movement to the East Coast. The effect of the increased movement is reflected by the fact that obtaining tank cars for movement of other products has become more difficult within recent weeks.

In spite of the fact that nation-wide gasoline rationing is scheduled to be put into effect soon there has been no change in natural-gasoline prices. Demand was reported stronger this week. There is a possibility that the demand for gasoline will be increased in view of the fact that some pipe-line companies pumping northward through reversed oil lines are using excess gasoline to lower viscosity and thus lighten the pumping load. Consideration is being given to reversal of other crude lines in the Gulf Coast area to supply the 24-in. War Emergency line and this may prove an important factor in keeping gasoline stocks down during the rationing period. Just how much this potential demand will absorb cannot be determined at this time, but it is at least encouraging to market observers.

Pacific Coast

LOS ANGELES, Calif.—The general market this week continued quiet with spot movement at low levels.

Gasoline prices have been declining fractionally. Production and stocks of gasoline exceed demand. The possibility of decreased sales as a result of rationing is preventing a firm stand by marketers.

Natural gasoline is moving in small volume at unchanged prices.

Fuel-oil demand continues high and stocks are being reduced at a rate of 20,000 to 30,000 bbl. per day. There is nothing to indicate change in fuel-oil demand.

The demand for gas oil and diesel exceeds the amount available and consequently every barrel that enters the spot market is absorbed immediately.

REFINERY AND TANK-WAGON PRICES

(Prices as of October 13)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	.....	5.875-6.000	.....	5.500-5.625	5.125-5.250
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast	9.80	.....	.....	9.2	9.2	.....	9.2
Pacific Coast	.....	6.500-7.000	6.250-6.500	6.125-6.250	5.750-6.000	5.125-5.250	4.750-5.000

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	3.625	4.350	.....
North Texas	3.250	3.900	.....
North Louisiana	3.375	4.050	.....
California	.....	.....	4.875-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500	4.375	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250-6.625	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-5.500	4.250
Northeast Coast	.....	.....	.....	6.80	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	‡$1.35-1.45	$0.85-0.90
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast	.....	.....	.....	6.800	2.780	1.65
North Louisiana	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.625-3.750	3.500-3.625	$0.85	$0.85
Pennsylvania (West)	5.875-6.125	5.875-6.000	†5.250-5.500	.....
Northeast Coast	6.7	6.7	1.95	1.65
Pacific Coast	5.5	5.5	‡0.80-95	§0.80
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—	
200-210 D, 10-25	27.00
150-160 D, 0-10	23.00
120-125 D, 0-10	22.00
Steam refined:	
600 dark green (untreated)	9.00 9.50
PENNSYLVANIA—	
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):	
10 pour point	30.50
15 pour point	29.50
25 pour point	25.00 28.00
Steam refined:	
600	15.00 16.00
650	15.50 16.50
600 flash	16.00 17.50
650 flash	17.00 17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Neutral Oil

CALIFORNIA		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	†2.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		37.50
10 pour point		36.50
15 pour point		35.50
25 pour point		30.00
200 vis. at 70° F., 3 color:		
Zero pour point		39.50
10 pour point		38.50
15 pour point		37.50
25 pour point		32.00

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.250
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250
NEW YORK—	
Wax in bags fully refined:	
130-132 (A.m.p.) wax	5.850
133-135 (A.m.p.) wax	6.150
Crude scale:	
124-126 (A.m.p.) w.s.	4.250
124-126 (A.m.p.) y.s.	4.250

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	—	72-74	68-70	65-66	60
Gulf Coast	.....	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-90
Pacific Coast	4.750-5.000	1.25-30	.....	.....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S R
Mid-Continent	16.8		28.8	24.8	
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	15.45	5.50	10.20
Boston, Mass.	14.90	4.50	9.50
Burlington, Vt.	16.90	5.50	....
Buffalo, N. Y.	16.20	5.50	10.30
Dover, Del.	16.70	5.50	11.20
Hartford, Conn.	15.60	4.50	....
Manchester, N. H.	17.30	5.50	10.50
Newark, N. J.	14.70	4.50	9.40
New York, N. Y.	16.10	5.50	9.50
Philadelphia, Pa.	16.20	5.50	11.65
Pittsburgh, Pa.	16.70	5.50	12.00
Portland, Me.	16.30	5.50	9.60
Providence, R. I.	15.00	4.50	9.30
Washington, D. C.	14.70	3.50	10.70
Average 14 cities	15.91	5.07	10.32

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	13.40	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	14.40	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.15	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	21.40	7.50	11.40
Birmingham, Ala.	18.50	8.50	9.00
Charleston, S. C.	18.45	7.50	....
Charleston, W. Va.	18.75	7.50	13.00
Charlotte, N. C.	19.60	7.50	11.00
Jacksonville, Fla.	21.40	8.50	10.40
Jackson, Miss.	17.50	7.50	8.50
Louisville, Ky.	16.50	6.50	8.50
Memphis, Tenn.	18.60	8.50	10.50
New Orleans, La.	16.75	8.50	*10.00
Norfolk, Va.	16.95	6.50	13.50
Average 11 cities	18.58	7.59	10.58

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.57	5.96	10.76
Average last week	16.57	5.96	10.76

Canadian Fields

(Continued from Page 83)

the Manitoba boundary. The discovery well, located by W. B. Fry in 1937, encountered a small gas flow, around 23,400 cu. ft. daily, at less than 200 ft. depth. The test was drilled by the Kamsack Gas & Oil Co., which up to the present has completed a total of 13 wells, ranging from 187 to 210 ft. in depth, all being producers, showing from 8,550 to 297,470 cu. ft. daily with an aggregate open flow of 738,570 cu. ft.

Some efforts have been made to develop deeper production. A deep test for A. Stanley Smith, financed by the Farmers' Cooperative Refining Co. of Regina, is down about 1,500 ft. A good gas and oil show, with potential crude production of 12 to 15 bbl. daily, was mudded off at 960 ft. but may later be given a production test. Northern Royalties' deep test, about ½ mile farther west, is fishing for drill pipe in a bentonite shale formation at 1,200 ft.

The Kamsack Oil & Gas Co. applied some time ago for a natural-gas franchise for the town of Kamsack, and this was definitely approved by a 3½ to 1 vote in a special election on September 28. The project will involve a short transmission line and a local distributing system. H. R. Davis, consulting engineer, of Buffalo, made a favorable report on the shallow field as a source of supply for the town, with good prospects of additional production at depth.

CRUDE-OIL PRICES

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Illinois basin	1.37
Pecos County, Texas	.95
Bradford, Pennsylvania	3.00
Van, Van Zandt County, Texas*	1.08

*No change since 5-21-41.

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas*
18-18.9	$0.80	....	....	....
19-19.9	.84	....	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.22	1.05	1.28	.92
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.02
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.06
38-38.9	....	1.21	1.44	1.08
39-39.9	....	1.23	1.46	1.10
40 and above	....	1.25	1.48	1.12

*Includes Lea County, New Mexico.

California Fields

(Continued from Page 74)

has a tremendous reserve in the West Cat Canyon field due to the developments of Miocene production and while it is a little too early to make a good guess as to how much has been proved up to date it is safe to say that Union's crude-oil reserves at Cat Canyon have been increased at least 50,000,000 bbl. to date. If the entire Cat Canyon field is ultimately found to contain this Miocene zone, which has good porosity and saturation along with 250 to 750 ft. or more thickness of oil sand, this well can be expected to produce about 250,000,000 bbl. of crude oil in the future.

COASTAL DISTRICT COMPLETIONS

Elwood, Santa Barbara County: Bankline Oil Co. 89-10 Permit, 15-4n-29w, flowed 3,000,000 cu. ft. gas, 38/64-in. bean, pressures 1,020/1,375 lb., T.D. 4,749 ft., open hole, top Vaqueros 3,221 ft., top Sespe 3,688 ft., converted from small oil well into a gas well.

Newhall Potrero, Los Angeles County: Barnsdall Oil Co. 30 Rancho San Francisco, 27-4n-17w, flowed 1,478 bbl., 33.3-gravity, 0.1 per cent cut, 975,000 cu. ft. gas, 32/64-in. bean, pressures 625/475 lb., T.D. 7,177 ft., perf. 6,909-34 ft., 6,969-7,175 ft., top first Modelo zone of Miocene age 6,245 ft., third Modelo 6,960-7,177 ft.

Santa Maria Valley, Santa Barbara County: Hancock-Bush, 6 Hopkins, 25-10n-34w, flowed 690 bbl., 15.2-gravity, 1.6 per cent cut, 48/64-in. bean, pressures 250/450 lb., T.D. 4,653 ft., perf. 3,655-4,647 ft., completed in Monterey of Miocene age.

LOS ANGELES BASIN

Continental Oil Co. has recompleted its discovery well in the Turnbull Canyon field of Los Angeles Basin, but production was still cleaning up at the close of the week and an accurate gage had not been taken. It looks good for about 150 bbl., which is just about what it did when it was originally finished. The hole was recently redrilled and deepened from 3,447 ft. to 3,670 ft. and it was hoped the additional footage would have resulted in a much larger well. The sand at this point on the structure is fairly tight, however, and a 150-bbl. well on the beam is the best the well can do. Derrick has been constructed for Continental's fourth well in the field and an early spud is anticipated. This new well should shed considerable light on this field, which has yielded one large flowing well and two small pumpers. Out of a total of three producing wells in the field at the present time, two had to be redrilled and the bottom of the hole whipstocked away from its surface location. The company's second well, located in the southern part of the field, drilled through a fault and had to be whipstocked northward to get commercial production. This well was finished as a good flowing well, but in failing to find production in a straight hole well definitely defined the southern limits of production. Continental's third well in the Turnbull Canyon field was located in the northern part of the structure and failed to find any oil sand when drilled in a straight hole. It was later completed after the hole had been whipstocked to the south.

Texas Co. has derrick up for 4-1-F Buena Park in the Buena Park field of Orange County, which the company discovered several months ago and in which two small wells have been finished as commercial producers and one hole abandoned. The new well will be drilled one 40-acre location east of 4-1-E Buena Park, which is the most westerly producing well in the field. The latter well is likewise the best producer in the field, having more formation open to production and yet it is the lowest structurally that Texas Co. has drilled in this field to date. The Buena Park field is considered an anticlinal nose plunging northwest and toward the area of greatest Pliocene deposits in the east side of Los Angeles Basin. Present production at Buena Park is coming from a zone equivalent to the Bell horizon at Santa Fe Springs.

LOS ANGELES BASIN COMPLETIONS

Coyote, East, Orange County: Hathaway Co. 6 Anaheim Union, 18-3s-9w, pumped 60 bbl., 22.6-gravity, 50 per cent cut, T.D. 5,480 ft., P.B. 4,570 ft., gun perf. at intervals 4,060-4,485 ft., lower portion of hole all water, completed in upper zone of Pliocene age.

Montebello, West, Los Angeles County: Kern Oil Co. 41 Monterey, 2-2s-12w, recompleted flowing 345 bbl., 24.8-gravity, 10 per cent cut, T.D. 7,860 ft., P.B. 7,391 ft., gun perf. 5,400-15 ft., 5,725-40 ft., P.B. to fifth zone of Miocene age.

Wilmington, Los Angeles County: D. D. Dunlap and Jonah Jones 2 L. B. H. D. Cerritos, 2-5s-13w, pumped 75 bbl., 16.5-gravity, 5 per cent cut, T.D. 3,130 ft., gun perf. 2,826-3,124 ft., completed in Ranger zone of Pliocene age.

Restrictions Are Modified on Equipment in California

(Continued from Page 20)

which large quantities of fuel oil and other special petroleum products necessary in the public interest and essential to the war effort can be obtained; *Now, therefore, it is hereby ordered,* That:

§ 1047.8 *Supplementary Order M-68-3—(a) Definitions.* The definitions of Conservation Order M-68, as amended, shall apply in this order.

(b) Wells deepened, plugged back, recompleted, or reworked in fields specified in Exhibit A. The provisions of paragraph *(b)* of Conservation Order M-68, as amended, shall not apply to any case where material is to be used by an operator engaged in the production of oil in the State of California, to deepen and recomplete, plug back and recomplete, or otherwise "rework" any well in any of the fields specified in Part I through Part III inclusive of Exhibit A of this order: *Provided,* That material shall not be used for any such purpose unless:

(1) With respect to the fields specified in Part I of Exhibit A of this order,

(i) Such well is deepened or plugged back and recompleted to produce from a geological formation or that portion of a geological formation described in Column No. 3 of Exhibit A opposite the name of the field in which such well is located, and such well is not deepened or plugged back and recompleted to a geological formation described in Column No. 4 of Exhibit A opposite the name of the field in which such well is located; and

(ii) Such well is not deepened to a depth greater than the depth specified in Column No. 5 of Exhibit A opposite the name of the field in which such well is located; and

(iii) The number of wells on any single lease or tract which are deepened, plugged back, recompleted, or otherwise "reworked" does not at any time exceed an average of one well to every 5 surface acres of that part or parts of such lease or tract as are contained within the productive limits of the field.

(2) With respect to the fields specified in Part II and Part III of Exhibit A of this order,

(i) Such well is deepened or plugged back and recompleted to produce from a geological formation described in Column No. 3 of Exhibit A opposite the name of the field in which such well is located, and such well is not deepened or plugged back and recompleted to a geological formation described in Column No. 4 of Exhibit A opposite the name of the field in which such well is located; and

(ii) Such well is not deepened to a depth greater than the depth specified in Column No. 5 of Exhibit A opposite the name of the field in which such well is located; and

(iii) The number of wells on any single lease or tract which are deepened, plugged back, recompleted, or otherwise "reworked" does not at any time exceed an average of one well to every 10 surface acres of that part or parts of such lease or tract as are contained within the productive limits of the field.

(c) Installation of pumping or other artificial lifting equipment. The provisions of paragraph *(b)* of Conservation Order M-68, as amended, shall not apply to any case where material is to be used by an operator engaged in the production of oil in the State of California for pumping or other artificial lifting equipment to be installed upon a well located on any single lease or tract in any of the oil fields specified in Part I and Part II of Exhibit A of this order: *Provided,* That material shall not be used for any such purpose unless:

(1) Such well is producing from a geological formation described in Column No. 3 of Part I of Exhibit A opposite the name of the field in which such well is located, and such well is not producing from a geological formation described in Column No. 4 of Exhibit A opposite the name of the field in which such well is located, and

(2) The number of wells to which pumping or other artificial lifting equipment has been or is to be attached does not at any time exceed an average of one well to every 5 surface acres of that part or parts of such lease or tract as are contained within the productive limits of the field; or

(3) Such well is located on any single lease or tract of 5 acres or less on which lease or tract no other wells are located to which pumping or other artificial lifting equipment is attached.

(P.D. Reg. 1, as amended, 6 F.R. 6680; W.P.B. Reg. 1, 7 F.R. 561; E.O. 9024, 7 F.R. 329; E.O. 9040, 7 F.R. 527; E.O. 9125, 7 F.R. 2719; sec. 2 *(a)*, Pub. Law 671, 76th Cong., as amended by Pub. Laws 89 and 507, 77th Cong.)

Issued this 8th day of October 1942.

ERNEST KANZLER,
Director General for Operations.

Louisiana Gulf Coast

(Continued from Page 79)

is coring ahead in shale below 9,382 ft. and casing is expected to be cemented for testing at an early date. The well is located in 35-3s-1w, and is an offset to the discovery well.

Texas Co. added another producing sand to the Leeville dome, La Fourche Parish, with the completion of 87 State, located on the south flank in 34-21s-22e. Drilled to a total depth of 9,456 ft., production was obtained by perforating casing at 8,944-70 ft., and the well gaged 164 bbl. daily while flowing through a 5/32-in. choke. Flank exploration during the year has opened several new sands for the structure this year.

LOUISIANA GULF COAST COMPLETIONS

Bayou Des Allemands, St. Charles Parish: Stanolind 2 St. Charles Land Co., 194 bbl., 5/32-in. choke, perf. 9,960-70 ft., T.D. 10,529 ft.

Deer Island, Terrebonne Parish: Humble 2 Continental Land & Fur Co., 5,500,000 cu. ft. gas, ¼-in. choke, perf. 9,565-70 ft., T.D. 11,470 ft.

Delta Farms, La Fourche Parish: California Co. 9 Delta Farms, 289 bbl., ⅛-in. choke, perf. 9,585-94 ft., T.D. 9,622 ft.

Gueydan, Vermilion Parish: Pure 2 Alliance Trust, 122 bbl., 10/64-in. choke, perf. 9,688-9,700 ft., T.D. 9,652 ft.

Leeville, La Fourche Parish: Texas 87 State, 164 bbl., 5/32-in. choke, perf. 8,944-70 ft., T.D. 9,456 ft.

Permian Basin, Panhandle

(Continued from Page 79)

TEXAS PANHANDLE COMPLETIONS

Carson County: Buchta et al 3 Lewis, Sec. 115, Blk. 4, potential 39 bbl. on R.R.C.T., T.D. 3,100 ft.

Hutchinson County: Holmes et al 3 Moore-Langdon, Sec. 125, Blk. 4, potential 251 bbl. on R.R.C.T., T.D. 3,078 ft.

J. M. Huber 24 Weatherly, Sec. 4, Blk. Y, potential 544 bbl., T.D. 3,036 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Arrowhead, Lea County: Ralph Lowe 1 Brownlee, NW SE 25-21-36e, abandoned location.

Gulf 5-C Leonard, E NW 36-21-36e, flowed 265 bbl. natural, pay 3,715 ft., T.D. 3,800 ft.

Maljamar, Lea County: Johnny Cockburn 5-B Miller, NW NE 25-17-32e, flowed 102 bbl. in 4 hr., pay 4,100 ft., T.D. 4,200 ft., shot 4,085-4,200 ft.

Maljamar Oil & Gas 13-B Mitchell, NE SW 19-17-32e, flowed 165 bbl. natural, pay 3,930 ft., T.D. 3,970 ft.

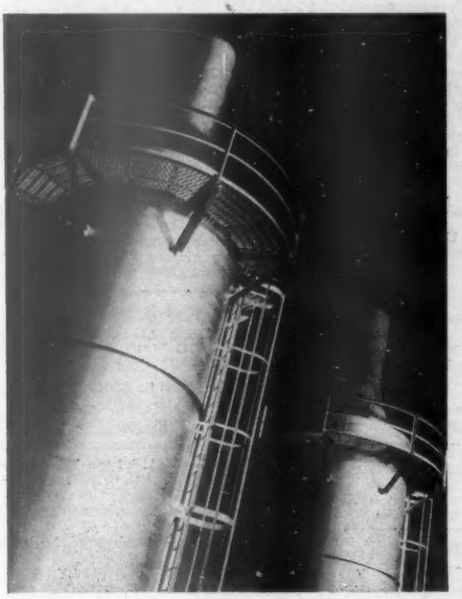
Carper Drlg. 3-K Simon, NW NW 30-17-32e, flowed 264 bbl. natural, pay 3,860-63 ft.

Vacuum, Lea County: Texas 1-AE State, NW NW 12-18-34e, pumped 16 bbl., pay 4,695 ft., T.D. 5,184 ft.

EQUIPMENT PROGRESS...

Iso-Flow Furnace Design Economical of Critical Materials

Among the many new operating ideas, new materials and newly designed apparatus contributing to the oil industry's war effort one piece of equipment is worthy of special attention for its over-all and



important contribution to increased efficiency with much less critical materials used in its design and construction. This is the Iso-Flow Furnace designed and manufactured by Petro-Chem Development Co., New York City.

The Iso-Flow Furnace design requires less than half the over-all steel, 35 per cent less headers, 50 per cent less alloys, 30 per cent less furnace tubes, 50 per cent less refractories, 40 per cent less foundations, no independent stack and 75 per cent less ground space, than is required for the conventional box-type furnace.

These features are found especially desirable in the refining industry's program of conversion and transformation toward the manufacture of more war products: aviation gasoline, toluene, butadiene, styrene, etc.

The Iso-Flow Furnace principles of operation and design are described in a bulletin recently released by the Petro-Chem Development Co. of New York City.

Hewitt Makes Conveyor Belt With Only Synthetic Rubber

Hewitt Rubber Corp., Buffalo, N. Y., has completed the manufacture of an all-synthetic rubber conveyor-belt which is believed to be the first of its kind made from buna-S synthetic rubber without the addition of natural or reclaimed rubber.

Hewitt was a pioneer in the production of synthetic-rubber products for the basic industries of the nation, starting with the introduction of the oil-resisting type of synthetic rubber in the United States in 1931.

Michael Berman, manager of research and development, stated:

"Hewitt is one of the large users of synthetic oil-resisting rubber such as neoprene, perbunan, HyCar, and thiokol. Among the many synthetic-rubber products, which are so vital to our armed forces for the prosecution of the war, developed in the Hewitt laboratories, are Smooth-Bore oil-suction and discharge hose for refueling of warships, bullet-sealing gasoline tanks for airplanes, and synthetic-rubber gasoline hose for the refueling of Army and Navy aircraft."

Buna-S, a nonoil-resistant synthetic rubber, will gradually replace natural rubber, Mr. Berman said, in the major lines of Hewitt products for war industries such as conveyor and elevator belting, transmission belting, pneumatic tool and welding hose, fire hose, railroad hose, acid and chemical hose, and many miscellaneous molded articles.

Catlow Takes Over Position As Republic Sales Manager

Harry B. Catlow, formerly district sales manager, Truscon Steel Co., Houston, Tex., has been appointed general manager of sales for Republic Supply Co., at Houston. A. B. Judd, vice president of the company, announced the promotion, Mr. Catlow assumed his new connection October 1.

TRADE LITERATURE

GRISCOM-RUSSELL CO., 285 Madison Avenue, New York, N. Y.—Bulletin outlining features of G-R Tubeflo Section. The bulletin includes a concise tabular comparison between its design characteristics and those of shell-and-tube exchangers, and descriptions of the principal applications for which these units are particularly adapted.

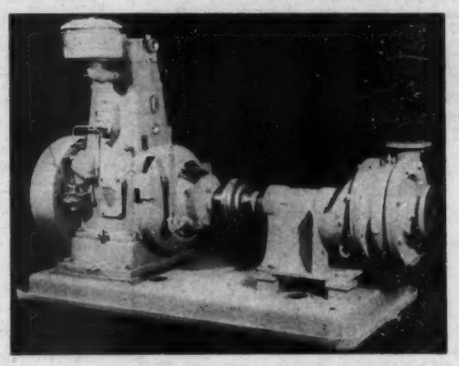
CRANE CO., 836 South Michigan Avenue, Chicago.—Bulletin on "How to Repair Valves." The fifth of a series, it explains and illustrates the various steps to take in repairing leaky gate and globe valves, and gives hints on how to reclaim discarded valves

CORE LABORATORIES, INC., Santa Fe Building, Dallas, Tex.—Reprints of a paper titled "Water Influx Into a Reservoir and Its Application to the Equation of Volumetric Balance," by William Hurst. The paper, presented before the New York meeting of the A.I.M.E. in February 1942, provides a tool for engineering studies of oil reservoirs. "The content matter," the company states, "presents the first quantitative method for determining water drive on an oil reservoir by the use of bottom-hole pressures and its validity is sustained by its agreement with the actual known rates of water encroachment in oil formations."

NORTON CO., Worcester, Mass.—Booklet on "How to Increase Tool Life." Analyzes proper care and operation of tools and proper application to obtain a higher quality of work.

Allis-Chalmers Pumps Aiding Wartime Industrial Needs

New in design and new in construction, Allis-Chalmers pumps are providing dependable pumping performance which is proving a real help in enabling industry to meet most exacting wartime require-



ments. These compact, sturdily mounted pump-and-power units are highly popular, not only with industrial users but also with the Government, for which they are also being manufactured. This model of Allis-Chalmers pump is powered with Witte diesel engines manufactured by the Witte Engine Works of Kansas City, Mo., which has joined hands with many pump manufacturers to produce combination pump-and-power units to serve America's war effort.

Neylan and Oldham Promoted In Lone Star Cement Shifts

Lone Star Cement Corp., New York, announced the election of John F. Neylan as vice president in charge of sales to succeed H. C. Koch, retired, and the appointment of J. Bryan Oldham as general sales manager

Mr. Neylan has been associated with Lone Star Cement Corp. for 23 years and until his election as vice president occupied the position of general sales manager. Mr. Oldham, who has been connected with the corporation for many years, was, until his promotion and transfer to New York, sales manager in charge of the corporation's Texas division with headquarters at Dallas, Tex.

ARMY-NAVY PRODUCTION AWARD TO BYRON JACKSON CO.

To Byron Jackson Co., Los Angeles, Calif., goes the honor of being the first concern to have presented to it two Army-Navy Production Award flags. The reason for this are two plants in Los Angeles, producing equipment and war materials for both the Army and Navy. Each plant is entitled to fly the Award flag. One plant is designated as the Slauson plant, and the other as the Vernon plant. Presentation ceremonies were held at the Vernon plant.

CLASSIFIED ADVERTISING

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Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years' Experience
Inquiries Invited
B. D. BUCKLEY
60 Broadview Drive, Clayton St. Louis, Mo.

FOR SALE: Oil and Gas leases on proven structures, drilling propositions, small production and fluorspar deposits. Reports furnished. W. P. Harley, Bowling Green, Ky.

FEW small tract considered on structure near 9,000 ft. East Texas Wildcat starting. Closing out 25 for one bets short time. E. Croft, Proctor, Texas.

WANTED TO BUY: Crude oil producing properties. Give number of wells, location, field, daily production, acreage, and price in first letter. Box B-290, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: Oil and gas leases North and South Dakota, reasonably priced. Owner, P. O. Box 1163, Tulsa, Oklahoma.

BARTLESVILLE Sand lease, 280 acres, 20 to 50' pay. Excellent water drive proposition, 3 successful ones vicinity; 4 wells on lease. Cash, over-ride, or working interest considered. Box B-281, The Oil and Gas Journal, Tulsa, Okla.

TO LEASE: The best Petroleum lands of CUBA according to Government Geologists. 1000 acres. Come and see them. Gustavo Roig, Capdevila 57, Habana, Cuba.

I OFFER Oil and Gas leases in West Kentucky; a small investment to develop. John Stouppas, Columbus, Ohio.

Legal Blanks

THE BURKHART LINE of Legal Blanks Since 1908. Oil-Gas and Business Forms for Mid-Cont. and Illinois Basin. Leases Rev. with Gov's Regulations. Catalog and Samples. Burkhart Ptg. & Sta. Co., 115 So. Cincinnati, Tulsa, Okla.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

CORPORATION FINANCING, mining or oil. Services and facilities offered to assist undertaking merit. Box B-300, The Oil and Gas Journal, Tulsa, Okla.

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

Business Opportunities

REFINERY FOR SALE. For particulars write to Albany Oil and Refining Company, Box 433, Laramie, Wyoming.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

OIL PRODUCERS urgently need these 2-U.S. and 1 Canad. Patents for the Extraction of Oil from exhausted formation of Petroleum and Oil bearing sands, for sale or in royalty by Leo Strandell, Lometa, Calif.

FOR SALE: Landowner's Royalty under 120 acres leased to Humble Oil & Ref. Co. in Lea Co., N. M. North of the Big Hobbs Pool. 27 pools in County, HARRY S. WRIGHT, FARMINGTON, N. M.

Ranches and Farm Lands

50,000 ACRES AT $5.50. Well improved cow ranch. Worlds of gramma grass, also brushes, lots of water, good fences (five wires), six pastures, on railroad and highway, near good towns, immediate possession. Low taxes. W. H. Wilson, Carrizo Springs, Texas.

Situations Wanted

PRODUCTION OR FIELD SUPERINTENDENT: High class practical man. Twenty years experience. Box B-286, The Oil and Gas Journal, Tulsa, Okla.

PATENT ATTORNEY widely experienced in patent matters pertaining to the oil industry, including patent prosecution, infringement and validity investigations, preparation of opinions, contracts and license agreements relating to patents, and litigation. Also experienced in trade mark and copyright matters. Graduate of first class engineering and law schools. Desires to make new mutually beneficial connection, preferably with a corporation. Draft deferred. Box B-301, The Oil and Gas Journal, Tulsa, Okla.

A VERY capable production man, sixty years of age, knows how and can handle production and clean out wells. Box B-310, The Oil and Gas Journal, Tulsa, Okla.

EXECUTIVE position with substantial independent operators will be considered by man with 20 years experience. Applicant is familiar with all angles of business including organization, personnel, taxes, accounting, financing, exploration, leasing, drilling, production, pipe line, refinery and marketing. Prefer salary and interest in company or salary and interest in profits. Write Box B-311, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

NOTICE TO ADVERTISERS

Advertisers offering positions to workers skilled in critical war industries are requested by the War Manpower Commission to include the following sentence in their advertisement:

"Applications from those now employed in war industries will not be considered."

ENGINEERS WANTED

Chemical or Mechanical with minimum one year oil refinery plant operation or maintenance experience. Require University Engineering School graduate with basic knowledge principles fluid flow. To work on process flow sheets, equipment selection and general handling oil refinery. Defense Contracts as assistant to senior engineers. No aliens or men engaged Defense work considered. Opportunity up to individual. In reply state experience, education, draft status, salary expected. Foster Wheeler Corporation, Room 2402, 165 Broadway, New York.

WANTED
REFINERY DESIGN ENGINEER

Permanent position for man with thorough knowledge of pressure vessel and piping design. Experience as chief draftsman and construction engineer is desirable. Location middle west. Medium size independent company. In reply please specify personal data, experience, draft status, and salary required. Reply Box B-292, The Oil and Gas Journal, Tulsa, Okla.

Oil Industry Printing

OIL FIELD LEGAL BLANKS

Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Equipment Wanted

ATTENTION INVENTORS

Old established Pacific Coast Manufacturing Company is interested in acquiring patented or patentable items for manufacture on either outright purchase or royalty basis. Box B-251, The Oil and Gas Journal, Tulsa, Okla.

WANTED: Inside Micrometers, range 2 in. to 14 in.; also outside micrometers, same range. Would consider instruments covering part of these ranges. In reply give make, style, graduations, and price. TALCO ASPHALT & REFINING DIVISION OF SOUTHPORT
P. O. Box 1011, Mt. Pleasant, Texas

WANTED: 64,000 ft. of 6 inch seamless high pressure line pipe or can use drill pipe. State location and price. Will buy in small lots. Melton Machinery & Supply Co., Seminole, Okla.

Equipment Wanted

WANTED TO BUY

Pipe of all sizes, 2" to 16", inclusive, also refineries, pipe lines and abandoned wells. Wire, write or phone

Louisiana Iron & Supply Co.
Shreveport, La.

WANTED: Used wax molding press. Please state condition, location, and price. Box B-293, The Oil and Gas Journal, Tulsa, Okla.

USED, good condition, 16 inch by 12 foot bed lathe with taper attachment and steady rest, equipped with motor drive. Also grinder attachment for above lathe for grinding pistons, etc. Box 1011, Mt. Pleasant, Texas.

WANTED

Abandoned *Pipe Lines*, in or out of the ground, *Oil Wells*, *Steel Buildings* and Steel Storage *Tanks* of all sizes.

JOS. GREENSPON'S SON PIPE CORP.
National Stock Yards, St. Clair Co., Illinois.

WANTED: 3—25 HP type 7E Bessemer or Hope Engines with direct connected compressor.

1—Two stage high pressure compressor to develop minimum of 20 cu. ft. per minute, suitable for making into V-belt drive.

THE VEEDER SUPPLY & DEVELOPMENT COMPANY
Cherryvale, Kansas

For Sale—Equipment

FOR SALE: Complete Wilson Portable Rotary Rig with telescoping mast, suitable for 2,000 ft. drilling. Melton Machinery & Supply Co., Seminole, Okla.

TWO vertical type Askania Magnetometers. Also one complete Heiland resistivity outfit. Write Box B-285, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: Complete Power Rig with three caterpillar Diesel motors, 425 H.P., suitable for 7000 foot drilling. Write Box 711 Longview, Texas.

FOR SALE: Special 4" pipe line equipment, new or nearly new. Pipe cutting, beveling machine, Holiday detector, tar kettles, Model F cleaning and priming machine, Rola Grip couplings. Tipton line up clamps, Petol tongs and others. No priority required. RAY R. LITTRELL, CONTRACTOR, Box 13, LaGrange, Ga.

FOR SALE—23,000' of ⅝" and 3,000' of ¾" Pump Rods. Four 87' MIW 157,000 Lb. Derricks. One TC20B Oil Well Pump Unit. All in first class condition. Dirks Brothers, Tuleta, Bee County, Texas.

FOR SALE: 50—5½" OD Standard IBBM NRS SE CI Gate Valves, unrepaired. $10.00 each. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE: Two Double Drum Cardwell Spudders, mechanical, like new. Complete tools, lines, dog house, and light plant. Room 314, Insurance Bldg., Oklahoma City, Okla.

FOR SALE or Trade for Shallow Proton: 45 Star Spudder, six years old, in fine shape. Good cordage. Tools 15" to 6⅝". Spang bits, boxes and pin. 60 HP Cat. tractor for power. C. N. Phillip, Gridley, Kansas.

TANKS FOR SALE

220,000 gal. 43' x 20' Steel Tank. 1—14,000 gal. and 2—11,000 gal. and 1—8,000 gal. Steel Tanks. 12—9' x 8' Wood Tanks.

L. M. STANHOPE
Wayne, Penna.

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Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	1 time	$5.00
1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

NEW COMPLETE INVENTORY

- Towers
- Vessels
- Storage Tanks
- Pumps
- Compressors
- Instruments & Meters
- Condensers & Exchangers
- Pipe
- Tubes & Headers
- Valves & Fittings

• Listings of Plains Oil & Refining Corp. included

Wire—Phone—Write for your copy

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba
Riverside at Second, Kansas City, Kansas

Robert W. Duden
Twenty-First at Union, Tulsa, Oklahoma

STORAGE TANKS

1—55,000 bbl. All Steel Riveted—6 Ring

1—55,000 bbl. All Steel Riveted—5 Ring

OFFERED FOR IMMEDIATE SALE, LOCATED EAST TEXAS. WIRE—PHONE—WRITE

SONKEN-GALAMBA SUPPLY CO.

Union Ave. at 21st St., Tulsa, Okla.
L.D. 410

BARGAIN—12 KW 125-Volt G. E. Generator complete with switch board, etc. GILBERT PIPE & SUPPLY, Electra, Tex.

F&M Power Pump, 3" x 4", excellent condition. Also Centrifugal and Steam Pumps. GILBERT PIPE & SUPPLY, Electra, Tex.

1 COOPER-Bessemer 3 cylinder engine. Type G M R size 12" x 14", 225 HP direct connected to Cooper-Bessemer Compressor, high side 12" x 14", low side 6½" x 14". Excellent condition. Box B-291, The Oil and Gas Journal, Tulsa, Okla.

STORAGE TANKS, Vessels, Towers, Pumps, Engines, Compressors, Meters, etc. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE: Approximately 250—2", 3", 4" and 6" LH EH SL UP Klein Pipe Tongs, used. $1.00 per inch per tong. Patridge, Cities Service Oil, Bartlesville.

BUCKEYE Model 15 ditching machine. Good condition. T. & L. Construction Co., P. O. Box 79, Phone 2653, Centralia, Ill.

FOR SALE: 7¼ x 14 Oil Well Power Slush Pump. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: 3—16" Baash-Ross Blow-out Preventers. Patridge, Cities Service Oil, Bartlesville.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x8 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO
26 West 2nd St., Cincinnati, Ohio.

FOR SALE: 60—4" 8V Thd. Fairbanks Sphero SE Valves, unrepaired. $10.00 each. Patridge, Cities Service Oil, Bartlesville.

FOR SALE: Star Mfg. Company, portable cooling tower, telescoping type, 7' wide, 13' long, 8' high. All steel. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: 30—1½ KW Steam Turbine Generators. $25.00 each. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

FOR SALE: At Oklahoma City, one Sectional Steel sand or rock storage bin with two dump valves, $350.00. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE: 27½" Ideal Rotary Table, 5 sheave 200 ton Crown Block, 4 sheave 72" traveling block, 8" Ideal enclosed rotary hook. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: 50—5½" OD 11½V Thd, 200—7" OD 10V Thd and 25—10" 8V Thd., used CI Flat Plugs, cheap. Patridge, Cities Service Oil, Bartlesville, Okla.

DIESEL—GAS—ENGINES

Large selection — All sizes and types. Generator units, marine engines, gasoline engines, auxiliaries—boilers, steam engines, and turbo-generator sets.

Complete information on request.

A. G. SCHOONMAKER COMPANY
48 Church Street, New York, N. Y.

FOR SALE: At Oklahoma City, 50 Solid and Split Casing Spiders with Slips for 9" and 9⅝" OD Casing. Complete, $50.00 each. Patridge, Cities Service Oil Co., Bartlesville, Okla.

40,000 Ft. 2" Line Pipe, Screw & P.E. Also 3", 4", 5½" 7", etc. Large stock of fittings, valves & other used material. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE—At bargain prices, a large quantity of magnesium rock wool and pipe insulation. Inquire Eason Oil Company, Enid, Okla.

For Sale—Instruments

FOR SALE: Star machine with tools, 5" to 10" complete. Would consider working on same, or anything pertaining to the oil field. Have had years of experience handling production. D. G. Minesinger, 308 North Street, Iola, Kansas.

FOR SALE—A large stock of reconditioned valves and fittings suitable for refinery and pipe line service. Inquire Eason Oil Company, Enid, Okla.

FOR SALE: 85—7" OD 10V Thd. SE 1500-lb. WP CS Hughes Drilling Through Control Gates, unrepaired. $100.00 each. Patridge, Cities Service Oil, Bartlesville.

FOR SALE: 12 K.W. Portable Light Plant Powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

FOR SALE—Three 15 x 10 and one 12 x 10 Pneumatic Compressors less motors or power units. In excellent condition, suitable for low pressure service. Inquire Eason Oil Company, Enid, Oklahoma.

FOR SALE AT BARGAIN—2 complete drilling rigs, 1 Unit Rig Company U-10 with 13,000 Diesel caterpillar with 7½ x 12 G. D. pump; also 1 type R. Cardwell double drum draw works, 160 HP engines ready to move on job. Box 1439, Tulsa, Okla.

FOR SALE: 1-5½ Keystone Spudder with International motor, portable tool house, fifteen hundred foot ¾" wire line and complete set drilling tools.
1-practically new 45 Star Spudder (extra good).
1-110 H.P. Twin 2 stage direct driven Miller compressor.
VEEDER SUPPLY & DEVELOPMENT CO.
Cherryvale, Kansas

⅞" Oklahoma City used sucker rods, 50,000 feet, good condition. 50—10 and 12" x 23' Channels. 3—24" x 20' Beams and some short pieces, smaller sizes. Some reinforcing sucker rods, all at Oklahoma City. M. R. Travis, 1702 S. Boulder, Tulsa, Okla.

FOR SALE

We offer 523, 55-ton all-steel, self-clearing DOUBLE HOPPER CARS consisting of:

160 USRA construction; built 1921-1922; with A-B brakes; 1880 cubical feet capacity.

363 built 1910-1915; with KD-1012 brakes, 1683 feet capacity.

ALL HAVE FULL "U" CAST STEEL TRUCK FRAMES.

Purchaser must buy all.

PRICE: $1700.00 each f.o.t. Pennsylvania

TERMS: Cash with purchase.

DELIVERY CAN COMMENCE IMMEDIATELY AND BE COMPLETED IN ABOUT 60 DAYS—AND VERY POSSIBLY SOONER.

Some $30,000 to $40,000 NEW REPAIR MATERIALS also available which you may wish to have inspected at the same time.

TIME and EXPEDITION ESSENTIAL and DESIRABLE.

Yours for Victory,

IRON & STEEL PRODUCTS, Inc.

37 years' experience
13412 S. Brainard Ave., Chicago, Illinois
"ANYTHING containing IRON or STEEL"

BUY AND SELL

Used Engines, Compressors, Power Plants and Gasoline Plant Equipment.

We Rebuild and Guarantee

L. F. SMITH CO.

217 W. Archer, Tulsa, Okla.

Steel VALVES!

Cast and Forged

Also

Cast Iron Valves

Standard and High Pressure

Every Type Used in an Oil Refinery

All Expertly Reconditioned and GUARANTEED to Perform Like New.

No Delays

Immediate Delivery

YOU SAVE 25%

Over Cost of New Valves

Brown-Strauss Corporation

1446 Guinotte . . . Kansas City, Mo.

National Lubricating Grease Institute Has Timely Program

The special problems in grease lubrication which now confront manufacturers under the war-production pressure will be considered at the National Lubricating Grease Institute at a 3-day program for its tenth annual meeting in New Orleans on October 26, 27 and 28.

At the morning session, October 26, the meeting will be opened by Sidney Bevin of Fiske Brothers Refining Co., institute president. This will be followed by the address of welcome by ex-President W. H. Saunders, Jr., of the International Lubricant Corp. The first paper will be read by Charles Kraus of the Alemite Division of the Stewart Warner Corp. on the subject, "The Proper Application of Lubrication Greases to Machinery." In the Monday afternoon session, "Army Grease Developments" will be discussed by Walter Ainsley, consultant in the Office of the Chief of Ordnance Division. This will be followed by a paper on "The Flow Characteristics of Lubricating Greases," by A. Beerbower, L. W. Sproule, J. B. Patberg and Dr. J. C. Zimmer, prepared by the latter, all of the Esso Laboratories. Thomas A. Maxwell's paper on "The Low Temperature Characteristics of Greases" will close the first day. Mr. Maxwell is with the International Lubricant Corp.

The second morning will be taken up with meetings of the individual committees and these will be restricted to members only. In the afternoon, Ralph Nicholson, publisher of the New Orleans Item, will discuss timely topics and will be followed by a paper prepared by C. W. George of the Enterprise Oil & Grease Corp. as a "Survey of Lubricating Grease Testing Methods." Then "The Railroad Aspect of Lubricating Greases" will be discussed by Charles B. Bryant of the Southern Railroad system. The institute's annual banquet will be held at 7:30 October 27.

Wednesday, S. L. Biskin of the Humble Oil & Refining Co. will deliver a paper on "A Review of Rust Preventives and a Suggested Plan for Their Valuation." This will be followed by a paper on the subject, "Change in Grease Manufacture Due to the Government's Need for More Glycerin." The morning session will be concluded by a paper, "Lubricants for Antifriction Bearings in War Service," by O. L. Maag of the Timken Roller Bearing Co. The annual business session at which directors will be elected for the coming year will end the meeting.

Journalisms:

THE authors of this week's lead engineering story are engineers for the Arkansas Oil and Gas Commission, Mr. Crowell being the director. Thomas D. Bailey comes from South Dakota and received his training in the petroleum engineering department of University of Oklahoma, having graduated in June of this year. While at the university he won first prize on a paper entered in the Mid-Continent division of the A.I.M.E. student-paper contest and the paper published this week has been entered in the national contest. Prior to joining the commission's staff, Mr. Bailey was chief computer of National Geophysical Co.

ALEX M. CROWELL

THOMAS D. BAILEY

Alec M. Crowell began his petroleum engineering career in 1926 with Empire Oil & Refining Co. After 4 years in the Mid-Continent, he spent 2 years with Del Rey Oil Co. in California, returning to the Panhandle for Shamrock Oil Co. Between 1933 and 1938 he was director of field engineering and research with the Texas Railroad Commission and in March 1938 went to Arkansas to organize and direct the operation personnel of the Oil and Gas Commission.

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OKLAHOMA lease names are plentifully interspersed with such names as To-Who, Pau-Kune, Kla-Da-Ing and Ah-Kah-Me, and, of course, the celebrated Minnie Bowlegs, but the Blackfeet of Montana who are now experiencing considerable prosperity from royalties in Cut Bank are no slouches when it comes to names. A recently assembled block included such lessors as Littlefox, Badmarriage, Margaret Dryrider, Dan Calfbossribs, Catches Headcarrier, Stealsgood Littlebull and Old Coyote.

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TO the oil man a sure harbinger of fall is the return of the convention season. Right now the season is in full flower, with October in the lead as the month when oil men gather oftenest. Seasoned convention goers are noting a difference between the programs this year and in previous years. There is an absence of frills, which are pleasant, but time consuming. There is more seriousness of purpose in the programs which have been streamlined into shorter and fewer sessions. The war, and how the industry can best contribute to winning the conflict, dominates the addresses, a fact which serves to keep the meeting on a plane different from a former day.

In addition to the regular meetings of the industry, nearly all the established technical, scientific and professional societies now have petroleum sections, which meet frequently to enable engineers to exchange ideas. The papers presented at these meetings are testimony to the caliber of the engineering and scientific talent that has been attracted to the industry. It would be a great loss if the war's exigencies should bring about a curtailment of these meetings.

CALENDAR

October

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, Hotel Ambassador, Los Angeles, Calif., October 15-16.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, thirteenth annual convention, Wichita, Kans., October 19-21.

NATIONAL STRIPPER WELL ASSOCIATION, annual meeting, Wichita, Kans., October 19.

SOCIETY OF AUTOMOTIVE ENGINEERS, Mid-west Fuels and Lubricants regional meeting, Tulsa, October 22-23.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

NATIONAL ASSOCIATION OF CREDIT MEN, Petroleum Division, St. Louis, Mo., October 26-28.

NATIONAL SAFETY CONGRESS AND EXPOSITION, thirty-first annual meeting, Sherman Hotel-Palmer House, Chicago, Ill., October 27-29.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, Austin, Tex., October 29-31.

WESTERN PETROLEUM REFINERS ASSOCIATION, technical meeting, Shreveport, La., October 30.

November

CALIFORNIA NATURAL GASOLINE ASSOCIATION, Los Angeles, Calif., November 6.

PETROLEUM ELECTRIC POWER ASSOCIATION, business session of member-company executives and election of officers, Baker Hotel, Dallas, Tex., November 12.

AMERICAN PETROLEUM INSTITUTE, twenty-third annual meeting, Palmer House, Chicago, Ill., November 9-13.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, thirty-fifth annual meeting, Netherlands Plaza Hotel, Cincinnati, Ohio, November 16-18.

AMERICAN ASSOCIATION OF OILFIELD DRILLING CONTRACTORS, second annual meeting, Mayo Hotel, Tulsa, November 19-20.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York, November 30-December 4.

AMERICAN CHEMICAL SOCIETY, national chemical exposition and national industrial chemical conference, Sherman Hotel, Chicago, Ill., November 24-29.

December

NEW MEXICO OIL AND GAS ASSOCIATION, annual meeting, Artesia Hotel, Artesia, N. M., December 2.

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA, Hotel Mayo, Tulsa, December 17.

1943

February

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, New York, February 15-18, 1943.

ADVERTISERS IN THIS ISSUE

Air Reduction Sales Co. 1
Ajax Iron Works 47
American Roller Bearing Co. 77
American Rolling Mill Co., The 66
Armstrong Machine Works 87
Baker Oil Tools, Inc. 8
Barret, William M., Inc. 83
Bethlehem Steel Co. 5
Brewster Company, The 87
Brown Fintube Co. 58
Cable, Jo H. 82
Cast Iron Pipe Research Association, The 24
Chain Belt Co. 28
Clark Brothers Company 71
Classified Advertising 94-95
Cleveland Trencher Company 84
Coffing Hoist Co. 81
Continental Supply Company, The 37
Davis Regulator Mfg. Co., The 81
Dayton Rubber Mfg. Co., The 45
Dearborn Chemical Co. 61
Diamond Chain & Mfg. Co. 48-A
Edward Valve & Mfg. Co. 27
Emsco Derrick & Equipment Company 69
Fibre & Metal Products, Inc. 86
Fisher Governor Company 67
Fluor Corporation, Ltd., The 54
Foster Wheeler Corp. 21
France Mfg. Co. 76
Fulton Sylphon Co., The 60
General Electric Company 40B-40C
General Geophysical Co. 62
Goodrich Company, The B. F. 3
Hazard Wire Rope Division of American Chain & Cable Co., Inc. ..... Inside Back Cover
Hughes Tool Co. ..... Back Cover
Hydril Co. ..... Front Cover
International Nickel Company, Inc., The 6
Lane-Wells Company 38
Laughlin Co., The Thomas 41
Layne & Bowler, Inc. 72
McCord Radiator & Mfg. Co. 86
Murray Iron Works Co. 59
National Tube Co. 52
New Bedford Cordage Co. 82
Page Fence Association 68
Patterson-Ballagh Corporation 74
Penberthy Injector Co. 19
Petroleum Advisers, Inc. 70
Phillips Petroleum Co. 42-43
Pittsburgh-Des Moines Steel Company 80
Pittsburgh Equitable Meter Co. ..... Inside Front Cover
Powell, Wm., Co., The 40-A
R-S Products Corp. 44
Reed Roller Bit Company 65
Seismograph Service Corp. 48-D
Shand & Jurs Co. 2
Socony-Vacuum Oil Co., Inc. 4
Southern Mill & Mfg. Co. 40-D
Sterling Machinery Corp. 82
Thompson Products, Inc. 59
Thornhill-Craver Co. 61
Timken-Detroit Axle Co. 75
Timken Roller Bearing Company, Steel & Tube Division 57
Union Wire Rope Corporation 78
Universal Oil Products Co. 22
Viking Pump Co. 60
Visco Products Company 35
Wagner Electric Corporation 73
Wall-Colmonoy Corp. 81
Watson-Stillman Co., The 63
Westinghouse Electric & Mfg. Co. 49
Wisconsin Motor Corporation 80
Young Engine Co. 67